CONVENTION NUMBER

TEXTILE WORLD RECORD

SEPT. 1915

THE GRISWOLD, NEW LONDON, CONN.

Annual Convention of

The National Association of Cotton Manufacturers

SEPTEMBER 9th, 10th, 11th.

LORD & NAGLE COMPANY *Boston, Mass.*

The TEXTILE-FINISHING MACHINERY CO.

Howard Building, Providence, R. I.

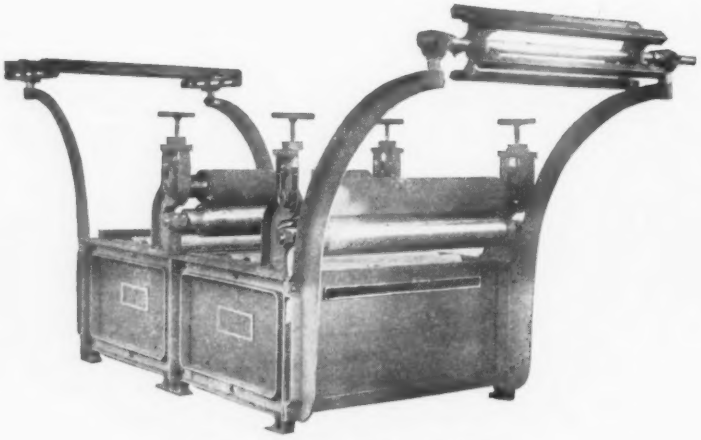
BUILDERS OF

Singeing, Bleaching, Mercerizing, Dyeing, Drying, Printing and Finishing Machinery

FOR

TEXTILE FABRICS AND WARPS

Plans and Estimates for Complete Plants



Two Compartment Dyeing Machine

Complete Dyeing Equipment

for

LOGWOOD, CUTCH, FUSTIC

and other Vegetable Dyes

Special Kiers

for

RAW STOCK AND LINTERS

Bleaching, Drying, Dyeing

and

Finishing Machinery

For Textile Fabrics

Bleach House
Machinery of All Kinds

Drying Machines
(Copper and Tinned Steel Cylinders)

Singeing Machines
(Oil and Gas)

Color Kettles
with Stirrers

Open Soaping
Machines

Calenders
For all Purposes

Mercerizing Ranges
(Piece and Warp)

High Speed Tentering Machines
for elastic finish with Automatic Clamps

Return Tentering Machines
for Woolen Goods

Hydraulic Presses

Dye House
Machinery of All Kinds

We are also sole Licensees and Makers in the United States for Daniel Foxwell & Sons, Manchester, England, of the

KAY & FOXWELL'S Patent Pneumatic Guider and Feeder

Simpson Patent Cloth Winder, No Stopping to Change Rolls, — Increased Production

H. W. Butterworth & Sons Co.

Providence Office
1212 TURKS HEAD BUILDING

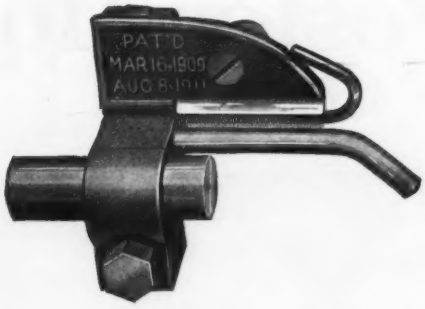
PHILADELPHIA, PA.

OUR RINGS

Set the Standard for Quality

THERE ARE NONE OTHERS
"JUST AS GOOD."

MIRROR SPINNING RINGS
TRADE MARK REG. U.S. PAT. OFF.
DRAPER COMPANY
HOPEDALE, MASS.



THE

MacColl Patent Spooler Guide

will, with a much more open setting, remove slubs or bunches that would pass through other spooler guides;
it will allow small piecings and knots which are unobjectionable to pass through;
it will pluck loose slubs and imperfections from the yarn without breaking, holding the slubs, etc., in the teeth until they are cleaned;
it is easily set, cleaned and adjusted;
as it works with a larger opening it requires less frequent adjusting than other guides.

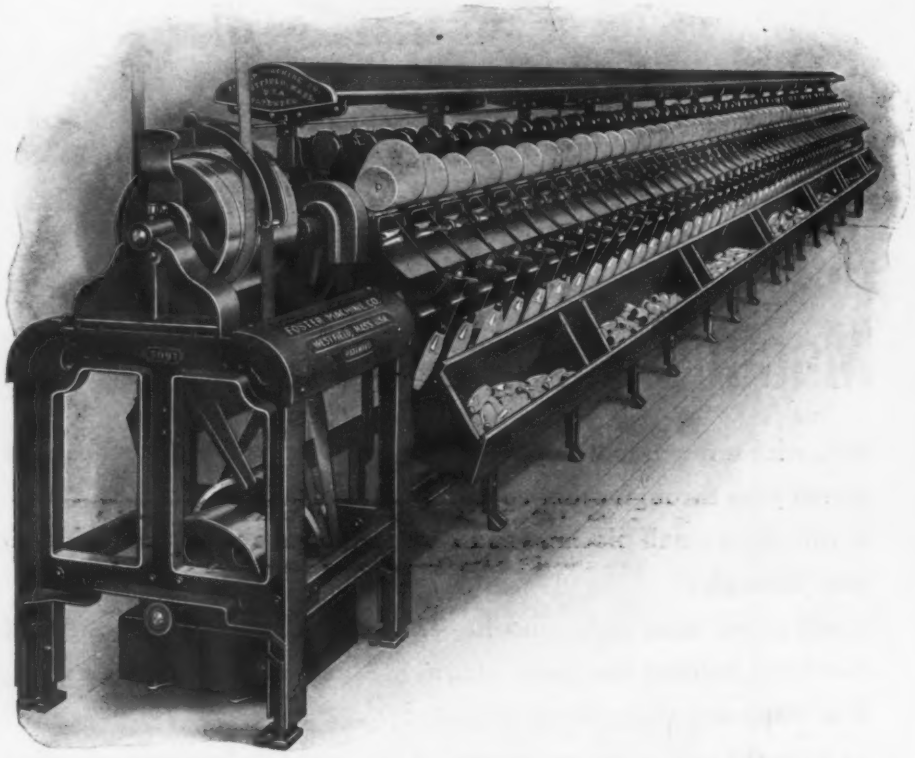
On worsted yarns the production in after processes is greatly increased, as the yarn is delivered practically free from slubs and it is unnecessary to stop continually to remove these imperfections.

DRAPER COMPANY

HOPEDALE MASS.

J. D. CLOUDMAN Southern Agt. 188 So. Forsyth St. ATLANTA GA.

The Foster Model 30



The Model 30 Cone Winder has every good principle of former Models incorporated in it. In addition, the new Model is more flexible of adjustment and may be set to produce finished cones of much greater taper than former Models, although paper cones of the same or lesser pitch are used.

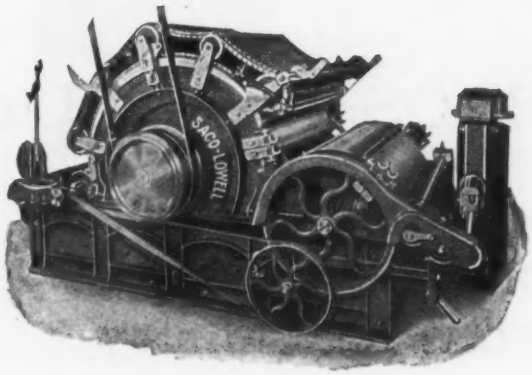
Foster Machine Company

Westfield, Massachusetts

JOHN HILL, Southern Agent, 1014 Healey Bldg., Atlanta, Ga.

Saco-Lowell Shops

TEXTILE MACHINERY



Shops—
Lowell, Mass.
Biddeford, Maine
Newton Upper Falls, Mass.

Executive Offices—
77 Franklin Street
Boston, Mass.

Southern Agent, ROGERS W. DAVIS,
Charlotte, N. C.

COMPLETE COTTON MILL EQUIPMENT
Including:
Pickers
Cards
Drawing
Evener Drawing
Roving
Spinning
Twisters
Slashers
Spoolers
Reels
Winders
Warpers
Looms

WASTE RECLAIMING MACHINERY

WORSTED MACHINERY
Including:
Revolving Creels,
Gill Boxes
Drawing Frames,
Reducing and Roving Frames,
Cap Ring and Flyer Spinning and Twisting Frames
Jack Spoolers

LEIGH & BUTLER

IMPORTING ENGINEERS

232 Summer Street, Boston, Mass, U. S. A.

Long Distance Telephone—
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Cable Address—
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TEXTILE MACHINERY

Sole Agents in the United States and Canada for

PLATT BROS. & CO., Ltd.

OF OLDHAM, ENGLAND

By far the Largest Makers in the World of

Cotton, Woolen and Worsted Machinery

Also Sole Agents in U. S. and Canada for

MATHER & PLATT, Ltd.

Equipment of Complete Works for

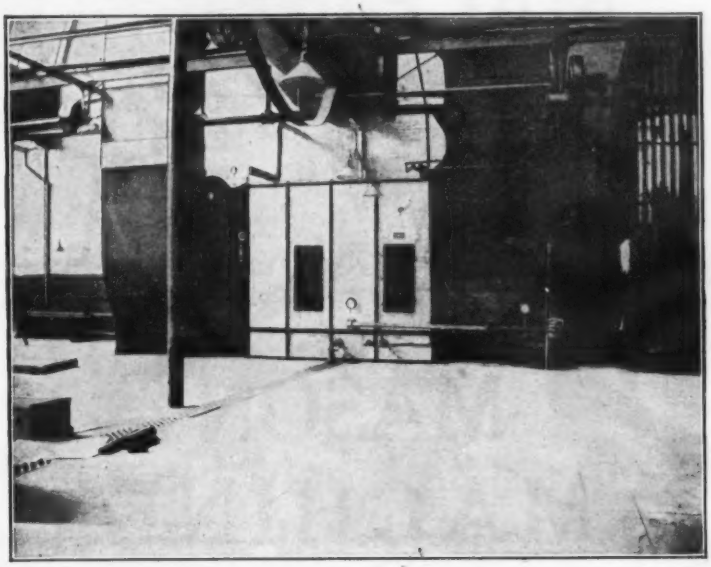
BLEACHING, CALICO PRINTING, DYEING AND FINISHING

Patent Mechanical FILTERS for Town Supplies and all Industrial Purposes

Wool Washing and Drying Machines, Napping Machines, Sykes' Card Clothing for Cotton, Critchley's Card Clothing for Woolen and Worsted, Wilson Bros'. Bobbins, etc., Harding's Pins, Fallers and Circles, Dronsfield's Grinding Machinery and Emery Fillet; Double Loop Bands, Scroll Banding etc.; Condenser and Gill Box Aprons, etc.

"CARRIER EQUIPPED" MILLS

Make for a High Standard of Efficiency



THE CARRIER SYSTEM maintains in plants all over the country, under all conditions, the right temperature and humidity for the manipulation of fibres.

Right conditions winter and summer mean a uniformity of production—mean that you can use to great advantage shorter staple raw material—mean better yarn and better cloth.

These conditions make your operatives healthier and more content and insure greater production.

It costs you nothing to have our engineer talk over the advantage of the CARRIER SYSTEM with you.

WRITE FOR OUR CATALOGUE

Carrier Engineering Corporation

39 Cortlandt Street, New York, N. Y.

BOSTON
176 Federal Street

CHICAGO
Transportation Bldg.,
Harrison and Dearborn Streets

PHILADELPHIA
Land Title Bldg.

BUFFALO, Mutual Life Bldg.

COTTON MILL MACHINERY

Carding Spinning

MASON MACHINE WORKS

Drawing Weaving

Executive Office, 77 Franklin Street, Boston, Mass.

Southern Office, Greenville, S. C., Edwin Howard

Works at Taunton, Mass.

POSTAL TELEGRAPH – COMMERCIAL CABLES

TELEGRAM

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SAN FRANCISCO CAL JUNE 23 1915

U S GUTTA PERCHA PAINT CO
PROVIDENCE R.I.

Rice's Gloss Mill White has been awarded Gold Medal
Congratulations HENDRICKS

RICE'S GLOSS MILL-WHITE

Awarded Gold Medal at Panama-Pacific International Exposition

THIS action is but an official recognition of what leading manufacturers of the country have discovered by experience. In over 3000 great plants, Rice's Gloss Mill-White now covers the ceilings and walls. It has increased their daylight, improved sanitary conditions, made workmen more contented, assisted in increasing output.

It can be applied by the Rice method, over old cold water paint.

Rice's is an oil paint, but does not yellow like ordinary ***oil*** paints. It is made by a special process over which we have exclusive control.

The tremendous advantages of this process enable us to make the following guarantee:

WE GUARANTEE that if Rice's does not remain white longer than any other Gloss Paint, applied at the same time and under the same conditions, **we will give, free, enough Rice's to repaint the job with one coat.** We also guarantee that, properly applied, Rice's will not flake or scale. You cannot lose under this guarantee.

Write today for booklet, "The Yellow Peril" and sample board

Write for our nearest distributing point

Reg. U. S. Pat. Off.

On concrete surfaces

On inside concrete, Rice's Granolith makes the best possible primer for a second coat of Rice's Gloss Mill-White—giving a tile-like enamel finish at no more expense than lead and oil paint

Rice's Granolith

U. S. GUTTA PERCHA PAINT CO., 20 Dudley Street, Providence, R. I.

Parks' Piping Parables

Sometime ago we bid on a piece of work—and we didn't get the job. There's nothing so very remarkable in that because we don't get all the work we figure on.

But this job we thought we would get.

We figured out what we thought the customer ought to have and gave him a fair price.

Sometime afterward I met this customer on the train. "Say,"—said he—"do you remember that job I didn't give you some little time ago? I gave it to another house because the price was lower—but when they turned the job over to me I saw there wasn't any pipe covering. I asked for it and got a bill for an extra—which, added to the original price, made the total more than your bid. Besides I didn't get Cochrane separators nor Pratt and Cady valves nor the Parko joint. Why didn't you post me?"

Said I, "My dear sir, we have been doing work for you off and on for years. You knew the kind of work you could expect. Besides you remember you said that all you wanted was the price and to send it by mail. Now, honestly, did you compare the specifications—or did you look at the price and let it go at that?"

"Well,"—said he—"I'll confess that's just what I did—and to tell you the truth, felt a little sore because I thought you were stinging me a little, but by good rights you ought to have had the job—for real values and final totals considered—your price was the lower. I'll be more careful next time."

In competition as to piping our platform is to compete with ideas as well as price. Oftentimes we include in our specification work that you might not think a part of your piping—like the pipe covering mentioned by my friend—and then you draw wrong inferences.

We don't like to do cheap work. On the other hand we don't like to get an undeserved reputation for high prices when our price includes a completeness that you ultimately have to pay for.

If you really want cheap work—and I don't believe you do—we can see just as many ways and means to cheapen as the next one.

We don't believe that ultimately you would be satisfied.

Besides—Parks piping done our way we stand back of. Done your way, we might have to ask you to assume the responsibility.

A Turbo Record

In 1909 when the Turbo was not so well known, we took a contract, our first with a certain customer, for 112 heads.

One clause of the contract imposed by the customer provided that every head that became inoperative (he was afraid of clogging) he was to send back to us for cleaning and readjustment at no charge to him.

That was in 1909.

Just as a matter of gossip, the customer has never sent us one head. All his heads are still in operation, and he has since bought several thousand more.

He is convinced. The initial performance did that.

He knows that the Turbo Humidifier is the humidifier with the guarantee:—and that guarantee is worth something; that the house behind the guarantee intends it shall continue to be worth something.

He knows better yet that when it comes to trouble, more is avoided by the use of the Turbo than is taken on. Moreover he knows that the Turbo is made as fine as a watch and of almost as good material.

And like a watch will stand an awful lot of lack of specific care.

The Turbo Humidifier is built on the service idea:—an interest in you long after your installation is paid for.

Ask one of our customers what that means. It would sound better to come from him than from us.

Our new R-12 head is a trifle in the way of refinement over anything that we have ever put out. The early question the skeptics asked of the Turbo was, will the orifices clog—or wear. It has been our experience that with the general run of conditions they do not. But occasionally—just often enough to make us ask ourselves if there wasn't something we could do to improve—there was a clogging of the orifices.

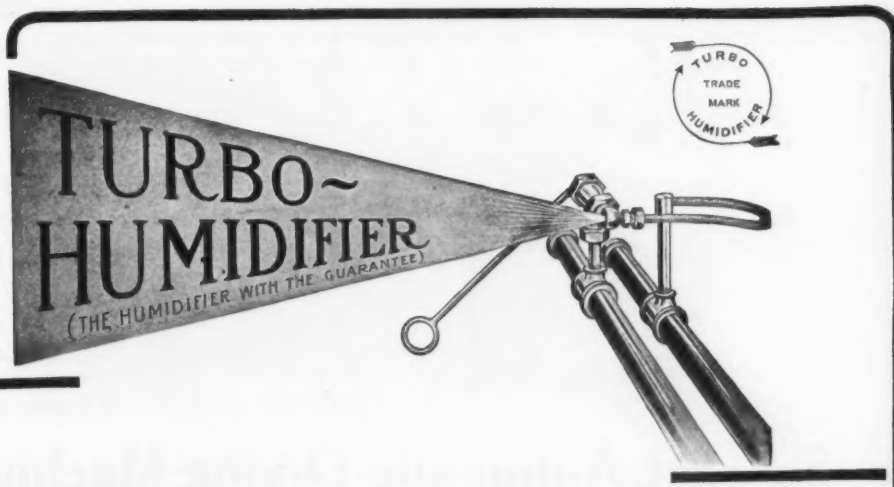
So we designed the R-12 which is different from any of the other R series. It has larger ports and more of them. It is more economical; that is, delivers more water per horse-power than any of our previous designs.

We mention this to suggest that we do not consider a thing perfect just because we happen to be making it: but we are always on a still hunt to put salt on the tail of an improvement.

As an aside remark—we have closed 55% of the Turbo business figured since the first of the year. Some is still in abeyance. Do these figures illuminate?

PARKO.

The G. M. Parks Company, Fitchburg, Massachusetts



"Its Simplicity Makes It Simply Great"

Some systems designed to humidify Cotton Mills suffer from an excess of parts, while others are deficient—in parts.

Thus "necessity, the mother of invention" produced the Turbo.

Because it has but few parts, *yet enough*, the Turbo is the *troubleless* Humidifier.

It will give you, regardless of the obstacles that building construction or Nature may have put in the way, exactly the right percentage of humidity required in *your* Mill.

Because of this it will increase the efficiency of your employees and the quality of your product.

It will keep down the number of "seconds" and add to the number of "firsts".

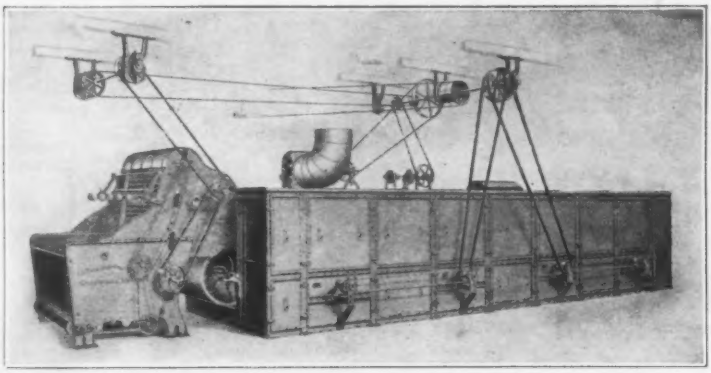
These qualities plus low up-keep make the Turbo an *expenseless* system of humidification.

Why not ask us to prove this to you? If you want to know more about this system before asking for proof send for catalog.

The G. M. Parks Company

Fitchburg, Mass.

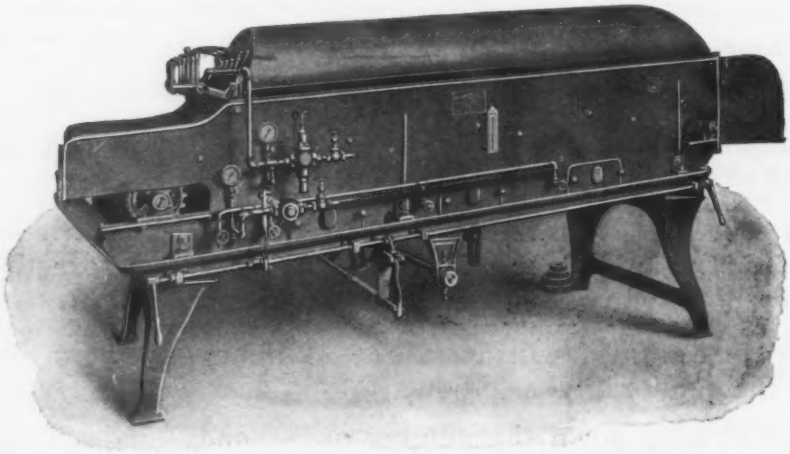
Southern Office, 200 Commercial Bank Building, Charlotte, N. C. **J. S. COTHRAN, Mgr.**



Sargent Automatic Drying Machines

For Drying Wool, Cotton, Hair, Silk, Flax

Containing exclusive features which permit greatest economy in operation. Ball Bearing Fans. Improved principle air circulation. Specially designed Feeders Automatic Apron Adjusting Device



The Yarn Conditioning Machine

The most effective and systematic method of setting twist
Eliminates Kinky Yarn difficulties

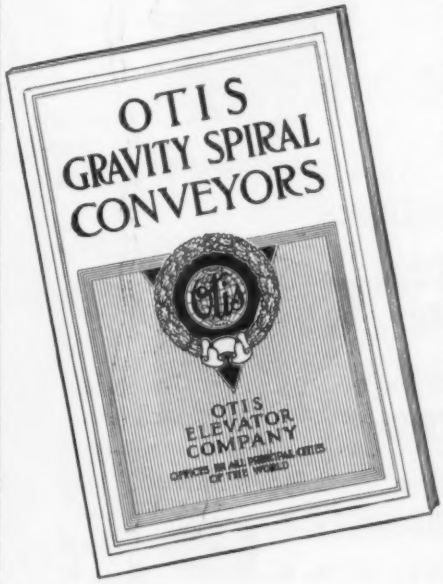
Wool Washers, Wool Dusters and Openers
Burr Pickers, Automatic Feeds for Cotton and Wool
Complete Carbonizing Plants

C. G. Sargent's Sons Corp., Graniteville, Mass.

If it were a personal card

A card comes to your desk accompanied by an introduction from many concerns of national reputation. You grant a hearing. You feel convinced that the bearer of a message so highly endorsed must have something to say worth your hearing.

In a way this advertisement is like such a card. Only it is the request for a reading and not the hearing about an equipment used and endorsed by nearly 400 concerns, a reading of how this equipment is saving thousands of good dollars annually on the operating expenses of these many different businesses.



Unlike and better than the card is this advertisement in that it asks you to hear no sales talk. Its aim is simply to put all the facts before you and let you decide for yourself upon the merits of the equipment for your business and plant. It does not even desire any of your business time. You can read and digest the valuable book which the coupon brings in the quiet and spare moments at your home.

Open the door behind which may be big savings for you. Open it this minute. Send the coupon

OTIS ELEVATOR COMPANY

Eleventh Ave. and Twenth-Sixth St., N. Y.

Offices in all Principal Cities of the World

Dept. 20
Otis Elevator Company, New York
Please send copy of your new book to

Name .....

Firm .....

Address .....

.....

The Hunter

NO. 10
FULLING
MILL

DRIVING SIDE

GEAR DRIVE

CLOTH WASHERS

PEICE DYE
KETTLES

SOAPING
MACHINES

BELT DRIVE

ROPE DRIVE

JAMES HUNTER MACHINE CO.

NORTH ADAMS, MASS., U. S. A.

A Consistent Winner

The Westinghouse Steel Type CS Motor

The Evidence:—

The following list showing some recent installations and contracts of Type CS motors ranging from 300 to 4000 horsepower:

Eagle & Phenix Mills	Georgia	J. & J. Dobson	Pennsylvania
Grantville Hosiery Mills	Georgia	Botany Worsted Mills	New Jersey
Pelzer Corporation	South Carolina	Princeton Worsted Mills	New Jersey
Brown Mfg. Co.	North Carolina	Grosvenor Dale Mfg. Co.	Connecticut
Flint Mfg. Co.	North Carolina	Livingston Worsted Mills	Rhode Island
King Cotton Mills	North Carolina	River Spinning Co.	Rhode Island
National Yarn Mills	North Carolina	Ludlow Mfg. Associates	Massachusetts
Ozark Cotton Mills	North Carolina	Naumkeag Steam Cot. Co.	Massachusetts
Revolution Cotton Mills	North Carolina	Waltham Bleachery	Massachusetts
Rosemary Mfg. Co.	North Carolina	West Boylston Mfg. Co.	Massachusetts
Scotland Cotton Mills	North Carolina	Mishawaka Woolen Co.	Indiana
American Viscose Co.	Pennsylvania		

Westinghouse Electric & Mfg. Co.

EAST PITTSBURGH, PA.

BOSTON
Boston Safe Deposit and Trust Building

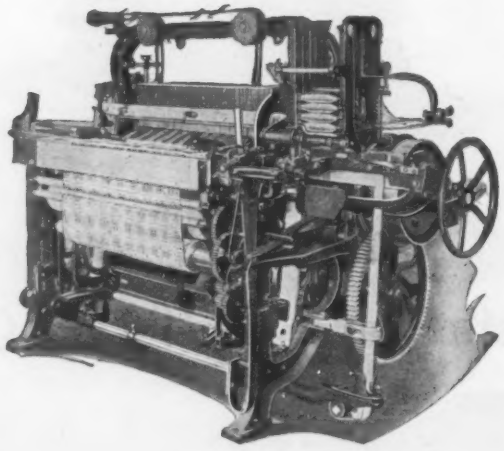
NEW YORK
165 Broadway

PHILADELPHIA
North American Building

CHARLOTTE
American Building

ATLANTA: Candler Building

Crompton & Knowles Loom Works



Automatic Gingham Looms

One of our latest productions for weaving goods of two or more colors in the filling. Like every loom we build, it has the advantage of a successful mill test.

WORCESTER, MASS.

Providence, R. I. **Philadelphia, Pa.**

Southern representative, ALEXANDER & GARSED, Charlotte, N. C.

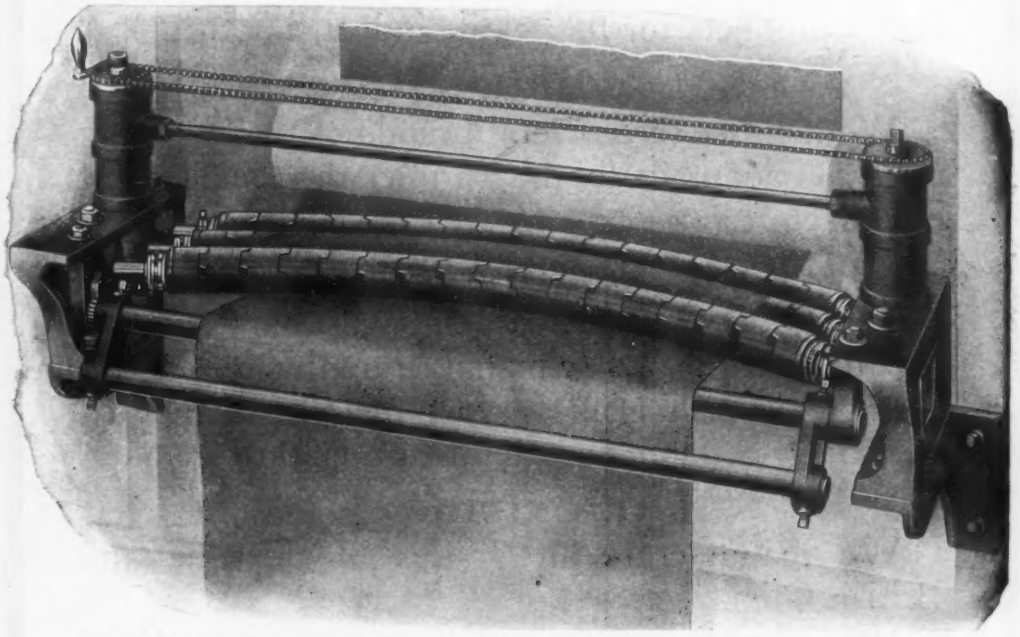
THOMAS LEYLAND & COMPANY

F. T. Walsh, Manager

Office and Works at READVILLE, MASS.

Sole Manufacturers of THE WILLIAM MYCOCK

Improved Regulating Cloth Expander



Expander attached to Calender showing Regulating Motion and Adjustable Tension Bars

This Expander and its improved features are fully protected by basic United States patents, and by others still pending, under which the builders will maintain their patent rights against any who may violate such rights by building, selling or using machines of this character.

We solicit correspondence from those having new ideas for Calico Printing, Dyeing, or Bleaching Machinery, either patented, or capable of being patented, and which they wish developed or manufactured.

Scutchers, Sewing Machines, Open Bleaching Machines, Blanket Washers for Calico Printers, Guides, Etc.

Starch

Textile Starches

We specialize in the manufacture of starch and starch products for the textile industry.

Thick Boiling Starches

We manufacture several brands of thick boiling starches adapted to the various requirements of manufacture.

Thin Boiling Starches

Penetrates the warp, adding weight and increasing the strength. We manufacture thin boiling for sizing and finishing in varying degrees of fluidity, according to the requirements of manufacture.

Dextrine

We manufacture all grades of dextrine and British Gum.

We are prepared to make a scientific study of your problems and show you how to use these products to your advantage and increase the efficiency of your process.

For information address

Corn Products Refining Company

17 Battery Place, New York, N. Y.

Starch

Paper Speeder Bobbins

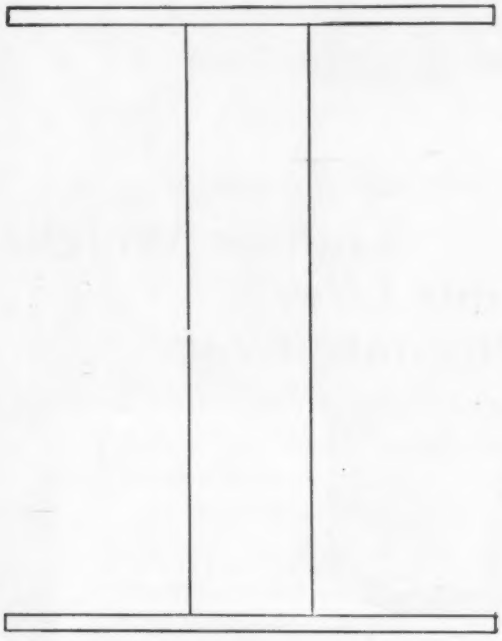
Will Neither Split, Chip, Swell, Shrink Nor Warp

These bobbins are far superior to speeders and slubbers made of wood. As they won't split or chip there are no rings or shields needed and that means reduced cost.

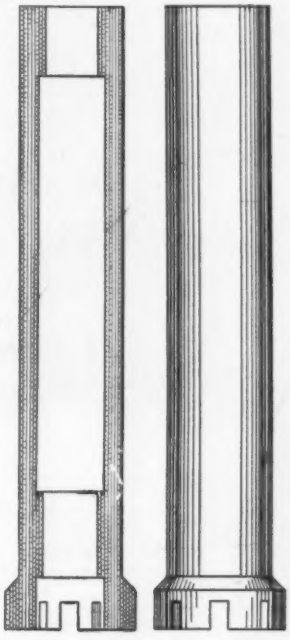
Not being effected by steam or other moisture they will not shrink, swell or warp and so are accurate in size at all times, and—

They Do Not Absorb Oil Which Insures Clean Yarn Free From Spots

Indorsed by 60 textile mills. Samples free on request.



Paper Spools In All Sizes



Paper Speeder Bobbin
Patents Pending

American Paper Bobbin Co., Inc.

670 Eddy Street - - Providence, R. I.
N. Y. Office, 13th St. and Boulevard, Long Island City, N. Y.

Paper Bobbins, Tubes, Spools, Horns and Megaphones

LANE

Canvas Mill Baskets Boxes and Trucks

FIG. 22.

Round Taper Style with Renewable Hardwood Shoes.
The Ideal Waste Basket. Made also without wooden shoes.

Increase Dividends Through

Less Waste Lighter Weight
Longer Life
Lower Ultimate Cost

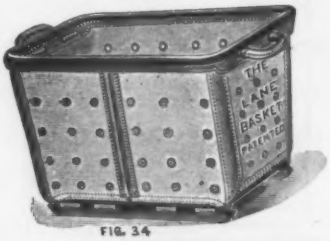


FIG. 34

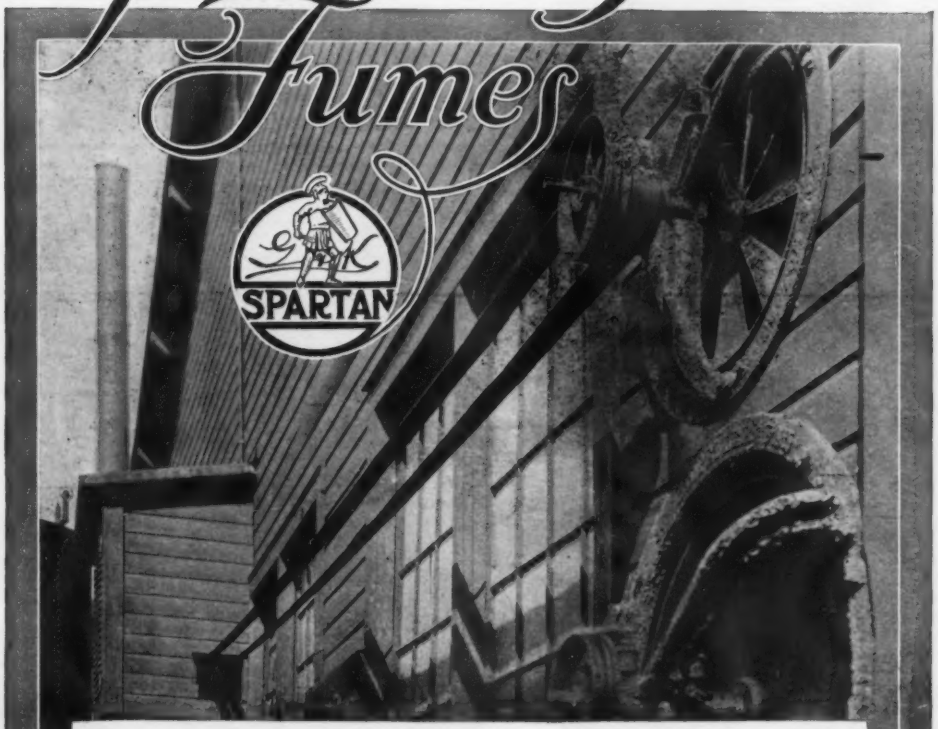
Oblong Taper Style.
A Steaming Basket with Great Durability and Quick Steaming Qualities.
Made in shape or size to fit any steam box.

A STYLE FOR EVERY USE

W. T. LANE & BRO., Mfrs.

POUGHKEEPSIE, N. Y.

Exposed to Acid Fumes



SINCE July Nineteen Fourteen this Spartan Belt has been pumping sulphuric acid fumes from the pickling room at the plant of the Halcomb Steel Co., Syracuse, N. Y.

The corrosion, as seen in the photograph, around the blower, indicates the action of the acid fumes and gives some idea of the unusual service conditions under which the Spartan Belt has operated.

This belt has not only withstood exposure to acid fumes for more than a year, but during that time has operated with absolutely no protection from weather extremes.

Notwithstanding the abnormal service conditions existing, Spartan has given perfect satisfaction, which is pretty convincing evidence that this Belting is impervious to conditions which quickly ruin ordinary belting. Why not Spartan Belting as a solution of your transmission problems?

THE GRATON & KNIGHT MFG. CO.
Oak Leather Tanners and Belt Makers
Worcester, Mass., - U. S. A.
Branches in Principal Cities

WATSON, LAIDLAW & CO. LD.

DUNDAS ST. SOUTH, GLASGOW

PATENT WATER-DRIVEN

HYDRO-EXTRACTOR

Underdriven Baskets

24 in. Diameter to 48 in.

Suspended Baskets

24 in. Diameter to 84 in.

Retain the benefit of self-balancing with entire absence of belts and gearing. No working parts requiring lubrication except spindle, which only requires a little grease once or twice a year. Can be placed anywhere regardless of power or moisture.

ABSOLUTELY SAFE

CALL OR ADDRESS

W. J. WAYTE, INCORPORATED

ONE LIBERTY STREET, NEW YORK

Pacific Coast Agents, BOURRET-KIRKWOOD COMPANY, Seattle, Wash.

Pierce-Arrow Motor Trucks *in the* Textile Trade

For the rapid and economical transportation of both raw materials and finished product, Pierce-Arrow 5-ton and 2-ton worm gear motor trucks have already a well-established reputation in the textile trade.

It is worth bearing in mind that the worm gear drive, particularly advantageous in textile service due to its extreme reliability and absolute cleanliness, was first introduced in this country by the Pierce-Arrow Motor Car Company. This construction is now very generally imitated, but no other American worm gear motor truck embodies the valuable results of years of experience under actual working conditions in many different kinds of service. If the advantages of worm gear drive appeal to you, it will surely be wise to purchase a truck which has long since passed the experimental stage.

If you will advise us exactly what your service requirements are, we can probably put you in touch with some textile operator who has found the Pierce-Arrow motor truck a satisfactory solution of a transportation problem similar to your own. The names of representative Pierce-Arrow truck owners in the textile trade follow:

The Worm-Gear
All Pierce-Arrow Trucks are equipped with the worm-gear drive, which is a positive guarantee of effective service under the most difficult conditions.

The Goodall Worsted Co., Sanford, Me.; Silk Finishing Company of America, New York City; Somerville Mfg. Company, Somerville, Conn.; Winslow Bros. & Smith, Norwood, Mass.; Rhode Island Processing Co., Coventry, R. I.; The Wanskuck Co., Providence, R. I.; Mansfield Bleachery, Providence, R. I.; High Rock Knitting Co., Troy, N. Y.; American Woolen Co., Boston, Mass.; Boston Woven Hose & Rubber Co., Boston, Mass.; Hoosac Cotton Mills, Boston, Mass.

The Pierce-Arrow Motor Car Co.

BUFFALO, NEW YORK

The Entwistle Line of Warping and Beaming Machinery

Repeated Re-orders Prove That This Line
Is Giving Complete Satisfaction In Many Mills

Beam Warpers

Entwistle Warpers are as simple mechanically as efficiency will allow. The slow starting motion insures even tension before operating at full speed. The Bearings cannot get out of line. Cut gears are used insuring smooth and quiet running. Special Warpers can be made for Beams up to 80 inches between the heads.

Beaming Machines

The Entwistle Beaming Machine for beaming chain warps can be arranged to take beams of various widths between the heads. It is also used for putting yarn direct from chains onto loom beams. The clutch gear drive gives a variety of speeds. The driver is a friction pulley, operated by a foot treadle.

Ball Warpers

The general arrangement of an Entwistle Ball Warper including Creel is similar to our Slasher Warper excepting that the yarn is wound in rope form on a wooden roll on the Balling Machine.

This machine will run 500 threads with drop wires in 2 rows, and 800 threads with drop wires in 3 rows.

Expansion Combs

Entwistle Expansion Combs are used extensively on other makes of warpers, as well as exclusively on our own. As it is patented it can be secured from us only.

The open iron frame makes it easy to clean and to watch expansion, avoiding damage to springs. Guide wire is in contact with the upper spring making Comb much stiffer.

In addition we make

Balling Machines Doubling Machines Creels
Card Grinders

and everything needed in the warping machinery line

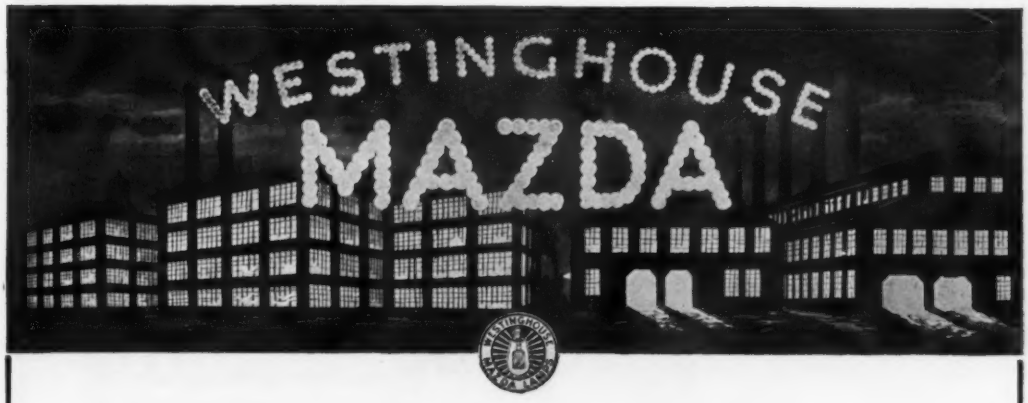
T. C. ENTWISTLE COMPANY

Established 1886 F. B. KENNEY, *President* *Incorporated 1901*

LOWELL, MASS.

Southern Representative

J. H. MAYES, Independence Building, Charlotte, N. C.



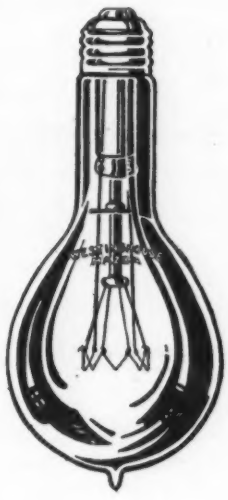
Maintain Your Rate of Production After Sundown

As the days grow shorter it becomes more difficult to maintain your rate of production.

Westinghouse Mazda Lamps will solve the problem.

WESTINGHOUSE
MAZDA
The Lamp for Industrial Lighting

There is a lamp for every outlet—all sizes from 10 to 1000 watts. Westinghouse *Mazda C Lamps* will reduce your current load and give your workmen the best light obtainable.



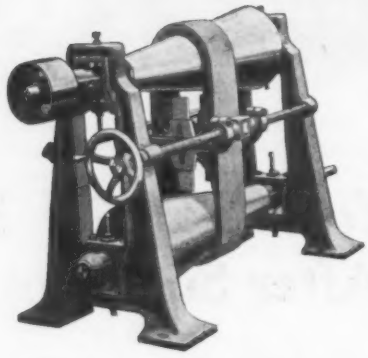
We have a booklet full of valuable, interesting facts on industrial lighting. We will be glad to send you a copy on request.

Westinghouse Lamp Company

Atlanta	Cincinnati	Los Angeles	Portland
Baltimore	Cleveland	Milwaukee	St. Louis
Boston	Dallas	New Orleans	Salt Lake City
Buffalo	Denver	New York	San Francisco
Butte	Detroit	Philadelphia	Seattle
Chicago	Kansas City	Pittsburgh	Syracuse

Export Sales Department—165 Broadway, New York
For Canada:—Canadian Westinghouse Co., Ltd., Hamilton, Ontario

Change Speed Without Stopping the Machine



SUPPOSE one of your operators wants to speed up or slow down his machine. Does he have to stop his machine to make the change in speed—decreasing his own and the machines productive capacity while it is slowing down and while it is gathering speed once more?

IT wouldn't be necessary to stop or even slow down if Moore & White Variable Speed Changes were used in your mill. They eliminate the expensive delays which prevail where step pulleys are used. They take up no more room than an ordinary countershaft. Any horse power from 1 to 200.

Send for Catalog "T"

The Moore & White Co.

Philadelphia, U. S. A.

Sole manufacturers of the well known Moore & White Friction Clutches

A Satisfied User
Is the Best Advertisment

Victor Manufacturing Company

Office of Greer Plant, Greer, S. C.

Steel Heddle Mfg. Co., June 7, 1915.
Philadelphia, Pa.

Gentlemen:—

The flat "Duplex" heddles on our 85 x 76 and 87 x 80 two-shade weaves are giving us the very best results of any type of harness we have ever seen.

We have been using your "Duplex" heddles for over five years on various cloth constructions ranging as high as 144 threads per inch and we are more than pleased with the satisfaction they have given us

Yours very truly,
Jno. N. Badger, Supt. Greer Plant,
VICTOR MANUFACTURING COMPANY

This is a letter from one of the many users of the *Duplex Heddles* who has been handling our product for a good many years. Thousands of looms are running today on *Duplex Heddles* and it will be only a short time from now when the Cotton Trade in general realizes the great advantage this heddle is giving in connection with the *Double Bar Universal Frame* on *Print Cloth Fabrics*.

Watch Results **Ask for information. Our Representatives will call at your mill on short notice.**

WRITE US TODAY!

Steel Heddle Manufacturing Company

21st and Allegheny Ave., Philadelphia, Pa.

Representatives, { J. H. HILL, 76 Dorrance Street, Providence, R. I.
HAMPTON SMITH, P. O. Box 210, Greenville, S. C.

There Is Only One

Cone Winding Machine

That will wind
Artificial and Natural Silk
and Mercerized Cotton

From the Skein to the Cone

It has all the latest improvements
including the

Cross Wind or Quick Traverse

Arguments mountain high will fade away when you use the

Altemus Cone

Made of metal, paper or wood, each
for its specific purpose

The only practical Cone that will let yarn off without resistance. It is made by

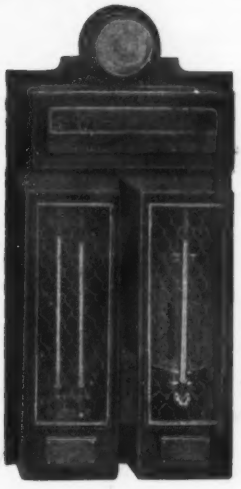
JACOB K. ALTEMUS

2824 North Fourth Street - - Philadelphia, Pa.

Textile Machinery for Winding, Spooling, Warping and Beaming

Cramer System
of
Air Conditioning

Cramer "High Duty" Air Conditioner



Cramer Automatic Regulator

FACTS

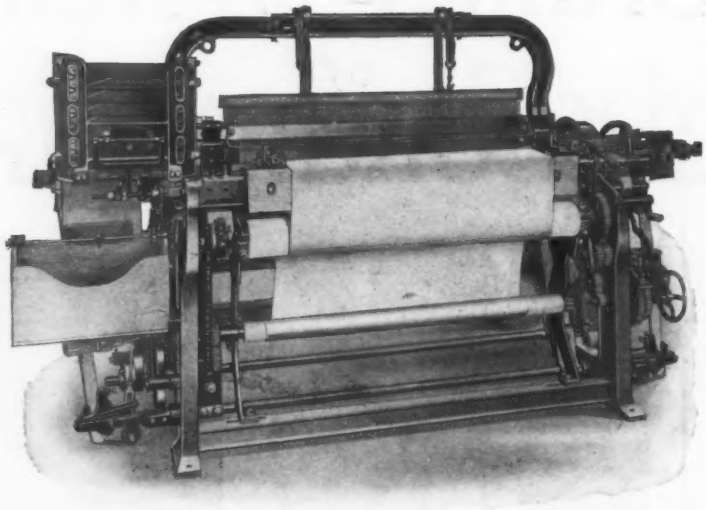
In several large mills equipped with humidifiers of other makes, we have entirely reorganized their system, installing our "High Duty" equipment with automatic humidity and temperature control and the average improvement during the succeeding twelve months test is:

A—Seconds reduced over 50%.
B—Production uniform day after day (No big jumps.)
C—Actual waste account halved.
D—Large saving in "invisible waste."

What Would Similar Results Be Worth To You?

STUART W. CRAMER

50 Church St. New York — **Charlotte, N. C.** — Tremont Bldg. Boston, Mass.



1915 MODEL PLAIN GOODS LOOM

1915 Model Plain Goods Loom
the Last Word in Loom Construction

It produces strictly high-grade cloth
Practically no seconds or waste

20-30 Looms per Weaver
50-60 per cent. Saving in Weaving Costs
and yet Weavers can Earn 40-50 per cent. more wages

Catalogue sent upon request

The Stafford Company

Readville, Mass.

FRED H. WHITE, Southern Agent, Charlotte, N. C.

Water Proof

Steam Proof

LEATHER BELTING

That Needs No Apologies

DUXBAK BELTING TRADE MARK

To Schieren belongs the credit of making the one leather belt which successfully meets the demands of belt users the world over. No matter where you may be located, whether in the far East, West, in the South or North, or what you may think a perfect belt should do you are justified in specifying "DUXBAK" Waterproof Leather Belting.

Chas. A. Schieren Company ESTABLISHED 1868

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Belt Manufacturers
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Interesting literature on the subject of belting may be had by addressing

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OILS FOR WOOL

Adapted for All Kinds of Wool Batching

In Daily Use by Leading Mills for Over 30 Years

They are as carefully and accurately prepared to meet textile requirements as long experience and expert chemical knowledge can devise. Only the best of materials are used and every gallon is made in our own factory

Paragon and Union Apron Oils

INCREASE PRODUCTION IN KNITTING MILLS

BORNE, SCRYMSER COMPANY

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Works: Claremont, Jersey City, N. J.

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Pres. and Treas.

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Home Bleach and Dye Works

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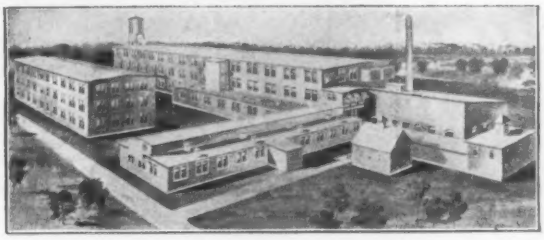


Dyers, Bleachers and Mercerizers of

Cotton Yarns

in skein and long and short

Chain Warps

Fast Colors a Specialty

Daily Capacity, 40,000 lbs.

Fast Colors and Black for Worsted Trade

Winding on Cop Tubes, Cones and Beams

Office and Works, Pawtucket, R. I.

Established 1881

A Satisfactory and Economical Belt

GUTTA-BALATA

An excellent substitute for leather belting, and costs less. Why not investigate?

Strong; pliable; belts 4-ply and heavier are absolutely seamless; not affected by wet or cold or oil.

Rubber Covered Rollers

For All Textile Uses

We were pioneers in the business of covering rollers with rubber, for various purposes. Our coverings have always been of the highest grade, and are today the best obtainable.

We furnish rollers complete—both iron work and rubber covering—and also apply rubber coverings to old metal bodies.

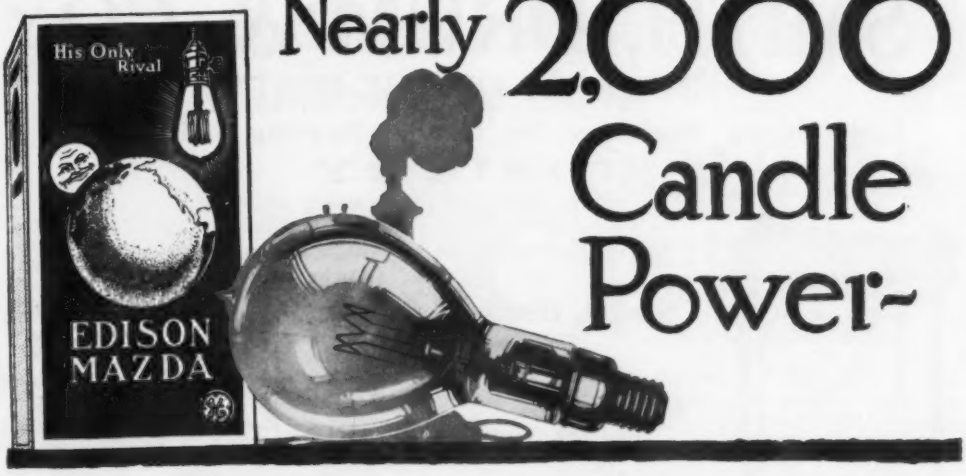
We make a variety of coverings and furnish rollers to withstand the action of acids, alkalis and other chemicals, hot and cold liquors, great pressures, and other severe conditions of service.

Let us estimate on your requirements.

Rubber Belting **Hose** **Packings**
Valves **Gaskets** **Diaphragms** **Matting**

BOSTON BELTING CO.

Boston **New York** **Buffalo** **Chicago** **San Francisco** **Portland, Oregon**



Nearly 2,000 Candle Power-

Greater efficiency and greater economy

So rapid have been the advances in incandescent lamps that some managers and owners do not quite appreciate the remarkable current economy of the newest lamps.

They are four to six times as efficient as old style, 16-candle power, carbon lamps. Moreover their metal filaments are fully as sturdy as carbon filaments.

EDISON MAZDA C lamps are at once the most powerful and the most efficient lamps we have ever produced in all our 36 years experience in the manufacture of over five hundred million lamps.

Whenever you need single units, ranging in candle-power from 125 to nearly 2000, you can save money by installing these powerful lamps. Buy through the usual channels or write us for any further data. Our lighting engineers will be glad to give the benefit of their broad experience on any of your lighting problems.

EDISON MAZDA C LAMPS (Gas Filled)

Made in U. S. A. and backed by MAZDA Service

EDISON LAMP WORKS OF GENERAL ELECTRIC COMPANY

General Sales Office, Harrison, N. J. Agencies Everywhere

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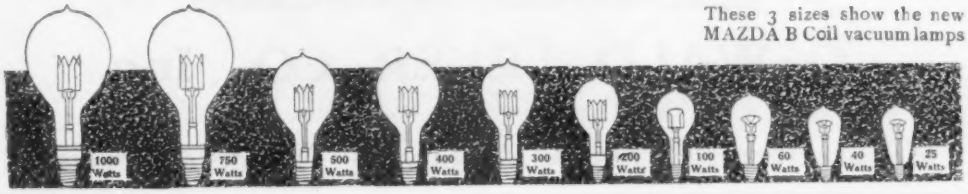
A size for every purpose and a lamp for every lighting need

These 3 sizes show the new MAZDA B Coil vacuum lamps



SMITH, DRUM & CO.

"BUILDERS OF THE BEST"

Labor Saving Machinery for Dyeing, Singeing and Finishing

HOSIERY

IN SULPHUR, ANILINE, DEVELOPED BLACKS AND COLORS
POWER SCREW PRESSES and MERCERIZING MACHINES

SAVE LABOR and **DYE STUFF** and do **BETTER WORK**
in your dye house by using

Smith, Drum & Co. Machines

Full particulars on application

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Southern Agent
H. G. MAYER
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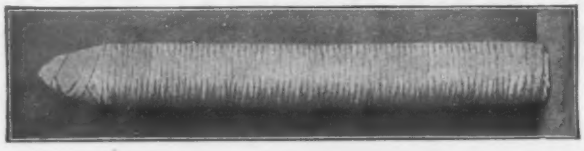
Cops to weave from inside seven-eighths to three inches in diameter and up to seventeen inches long suitable for various kinds of coarse goods such as grass matting, cocoa bagging, cocoa matting, all kinds of carpets, felts, chinchilla, linen, jute, flax, asbestos, hose and narrow fabrics, such as wicks, belting, webbing, surcingles, halters, etc.

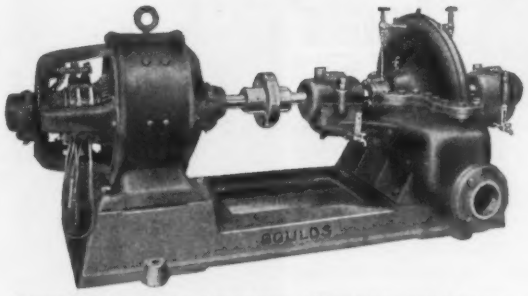


OSWALD LEVER CO., Inc.

13th and Cumberland Sts., Philadelphia, Pa.

Manufacturers of Textile Machinery—Winders Especially

You Get Both Low Installation and Low Maintenance Cost With



Goulds Double Suction Centrifugal Pump Direct Connected to Electric Motor

GOULDS Centrifugal PUMPS

The single-stage, double suction type shown, is the simplest design of pump for heads up to 150 feet. For a given capacity the first cost and amount of floor space required for its installation are a minimum.

Its simplicity, together with Goulds Quality, insure reliability, service and low maintenance cost.

Send for Bulletin

THE GOULDS MANUFACTURING COMPANY

Main Office and Works, SENECA FALLS, N. Y.

Branch Houses
Boston, New York, Chicago

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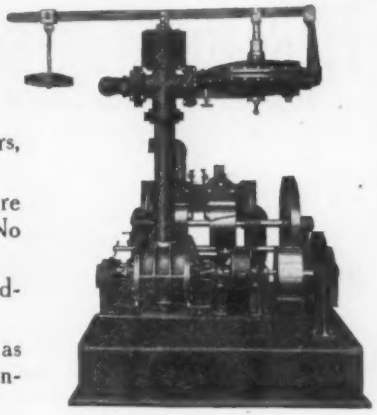
Kemp Automatic Gas System



Furnishes most efficient and economical method of utilizing city gas, either manufactured or natural, for such industrial purposes, as singeing, heating calenders, tentering machines, etc.

All air and gas mixing is done at machine, the mixture conducted through one pipe to place of consumption. No air valves or bunsens used at burners.

Flame temperature under perfect control and can be adjusted to produce the quality of singe desired.

Capacity of singeing machine frequently increased as much as 50%. Definite results and gas saving guaranteed. Equipment furnished on approval.

Write for proposition

THE C. M. KEMP MFG. CO.
405-413 E. OLIVER STREET
BALTIMORE, MD.

BIRCH BROTHERS

ALBERT BIRCH, TEXTILE MECHANICIAN

SOMERVILLE, MASS.

Starch Mangle.—This is the two-roll machine, with brass and rubber rolls. Mangles built with rollers of any material or number desired. Send for circular.

"Coronation"

Piece-End

Sewing Machine

Sent on trial most anywhere

Sews any fabric, thick or thin, wet or dry, without change

Fine Stitch or Coarse Stitch

Send for Circular

Also Makers of

Dyeing and Finishing Machinery

Scutchers, Openers, Folders, Crabbing and Soaping Machinery

FAIRBAIRN LAWSON COMBE BARBOUR LTD.

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AND AT LILLE, FRANCE.

MAKERS OF MACHINERY FOR PREPARING AND SPINNING FLAX, HEMP, TOW AND JUTE,

AND ALL

MACHINERY for the MANUFACTURE of TWINES and ROPE YARNS.

SOLE MAKERS OF

The Patent Centrifugal Flyer Cop Dry Spinning Frame

For Spinning Cops on the Bare Spindle.

ALSO MAKERS OF

ENGINEERS' GENERAL TOOLS for RAILWAY and ORDNANCE PURPOSES, &c., STEAM ENGINES, GROOVED ROPE PULLEYS, SHAFTING, &c.

COMPLETE PLANS AND ESTIMATES FOR SPINNING AND WEAVING MILLS SUPPLIED.

It's not only temperature that breaks down your Boiler Settings—but change of temperature

The fire brick and clay you are using may not be severely taxed by the temperature of your boiler furnace. They perhaps withstand the greatest working heat you need—but

Should it be necessary to force your boilers to their limit, then your furnace temperature rises accordingly. A little later someone opens the fire door, to coal, slice or clean the fire and in rushes a draught of cold air. What happens? Everything in the furnace contracts.

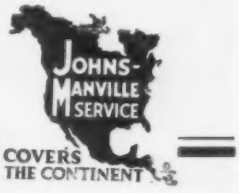
Fire clay can't stand these conditions. It crumbles out and disintegrates exposing the brick to a soaking heat.

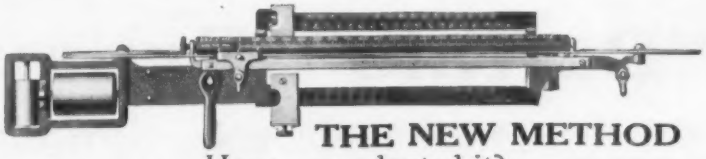
J-M No. 31 High Temperature Cement is able to weather this. It is resilient. When you lay it between the bricks it is there to stay as long as the bricks last. It prevents fire bricks from cracking or spawling. Number 31 Cement will stand 3185° Fahrenheit without melting.

Write for booklet describing J-M High Temperature Cement.

H. W. Johns-Manville Company

New York and every large city 3050-C





THE NEW METHOD

Have you adopted it?

National-Chapman Elevating Trucks

and

National Counting Machines

provide a new "weigh" in handling, trucking, counting, checking, loading, and unloading material.

Whether for storage, or for manufacturing, or during processes of manufacturing, a very attractive saving of from 50% to 90% can be accomplished. This opportunity is within your reach. You are losing money every day you put off looking into and installing this equipment.

Thousands of users prove the truth of these statements daily.

Write us for full descriptive catalogue.

NATIONAL SCALE COMPANY

18 Record Street, - - Chicopee Falls, Mass.

More Concerns Will Do It This Year

EVERY YEAR HAS seen more and more concerns turning to Schaum & Uhlinger Extractors as the cheapest, most economical way to obtain perfect extraction of liquids from solids, and separation of liquids of different densities.

This year will see the number largely increased. More than 2,300 Schaum & Uhlinger Extractors are already in use.

They are all demonstrating the advantages of sturdy construction and highly developed design, by quicker extraction, better extraction and cheaper extraction.

Have you investigated yet?

Write for facts about how Schaum & Uhlinger Extractors are helping others in your line to reduce expenses.

Tell us about *your* problem. No obligation.

SCHAUM & UHLINGER, Inc.

Glenwood Ave. & Second St., Philadelphia Pa.

"Buffalo" Exhausters

Efficient—Durable—Serviceable

"B" Volume Exhausters are especially adapted for removing smoke and fumes in small ventilating installations and for conveying dust and refuse in exhaust systems.

Cast iron solid peripheral shell absolutely prevents leakage at the points of highest pressure and removable side-plates give easy access to interior allowing blast wheel to be taken out without trouble.

Furnished for pulley or motor drive. Standard sizes in stock. Catalog 178-L-74 on request.

BUFFALO FORGE CO.

Buffalo, N. Y.

Manufacturers of Air Washers, Spray Nozzles, Forges, Blowers, Drills, Heating, Ventilating and Drying Apparatus

THIS textile mill is one of the great number of such plants almost exclusively equipped with "AMERICAN" STEEL-SPLIT PULLEYS.

Altogether over 2 1-4 millions of these time-tested pulleys have been marketed—principally because of the correctness of their design, and because they have demonstrated their ability to save power and money by nearly 20 years of service.

Our own stocks of over 50,000 pulleys at five convenient shipping points (with sizes ranging from 3 inches to 72 inches) is supplemented by those of over 200 dealers scattered all over the country.

So it is the quality of the pulley, the service that is offered, its 20-year old record, and the ease of getting it that makes the AMERICAN the choice of the great majority of power users.

Write for catalog and price lists today

AMERICAN PULLEY COMPANY

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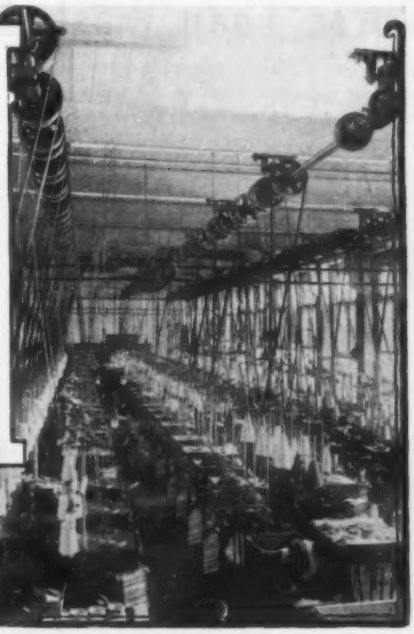
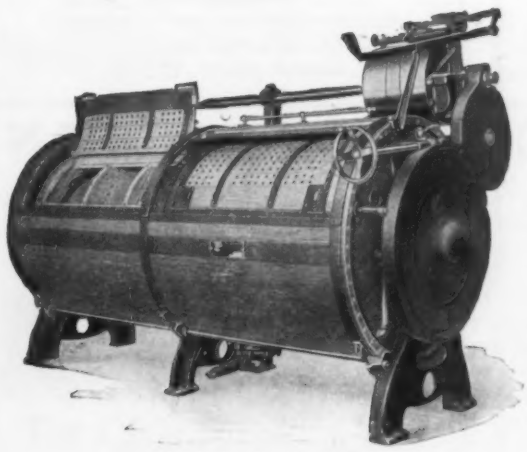


AMERICAN STEEL SPLIT PULLEYS

AMERICAN FULLING WASHER



ACME WASHER

Supplies the most up-to-date method of fulling woolens. Gives unequalled results with economy in time and labor. Superior construction to any other type of fulling machinery, assures long life.

Made in any length up to 120 inches and with any desired number of compartments.

Write for further details

THE AMERICAN LAUNDRY MACHINERY CO.

132 W. 27th St. New York City

208 W. Monroe St. Chicago

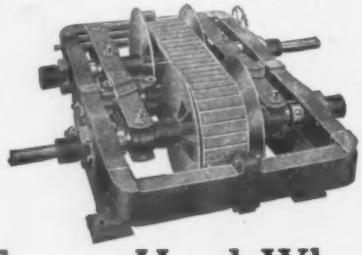
Norwood Station, Cincinnati

Worse Than Wasted

Time spent shifting a belt on cone pulleys, changing gears or fooling with a variable speed engine is worse than wasted. In addition to losing time and labor it stops production on the machine and spoils materials.

"The Reeves" **Variable Speed Transmission**

saves all such waste, expense, trouble and worry.



Turn a Hand Wheel

and get exactly the speed you want—never stop—keep running at highest consistent speed all the time.

Catalog "U" tells about it.

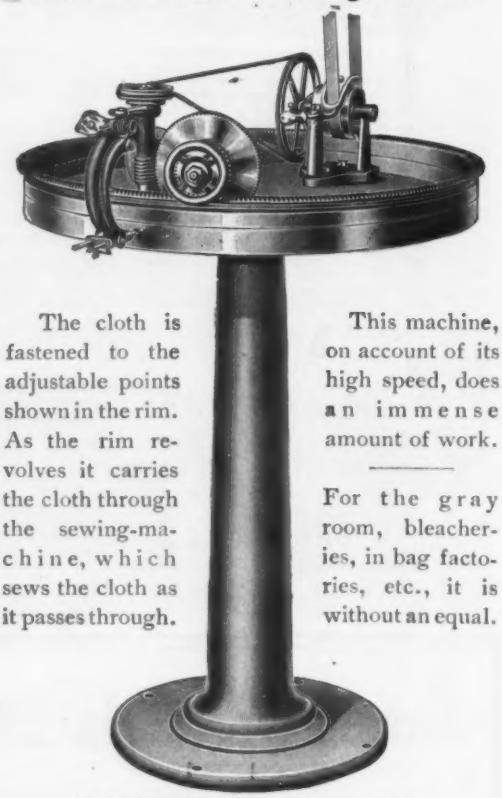
Reeves Pulley Co., - Columbus, Ind.

Chicago Branch, Corner Clinton and Monroe Sts.

EASTERN AGENTS:

Lewis E. Tracy Co., ... Boston
Patterson, Gottfried & Hunter, New York City
W. E. Shipley Machinery Co., . . Philadelphia

2000 STITCHES A MINUTE
THAT'S THE CAPACITY OF THIS
Power Circular Sewing Machine



The cloth is fastened to the adjustable points shown in the rim. As the rim revolves it carries the cloth through the sewing-machine, which sews the cloth as it passes through.

This machine, on account of its high speed, does an immense amount of work.

For the gray room, bleacheries, in bag factories, etc., it is without an equal.

Send for catalog of our sewing machines.

DINSMORE MANUFACTURING CO.
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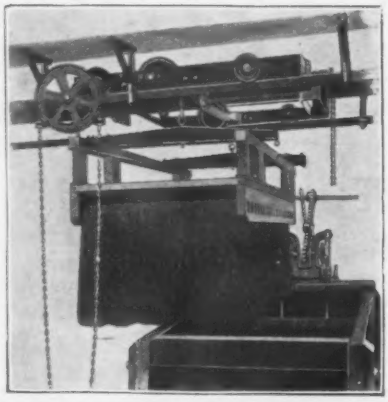
We guarantee lowest possible cost of dyeing



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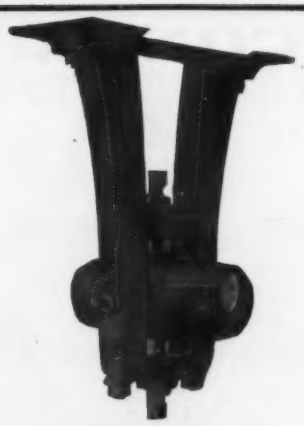

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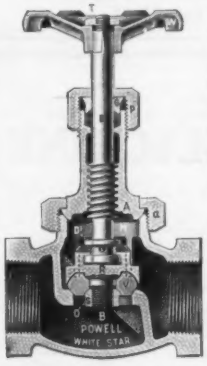

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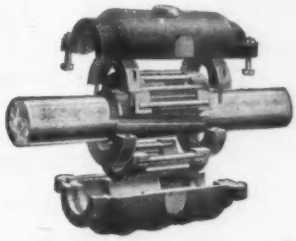

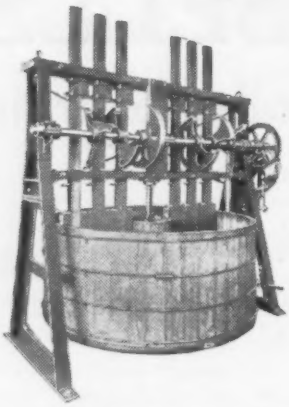

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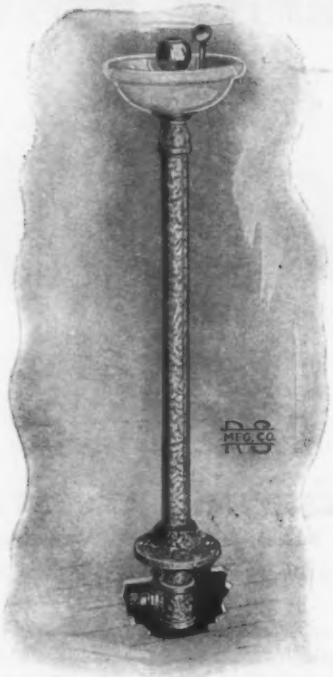

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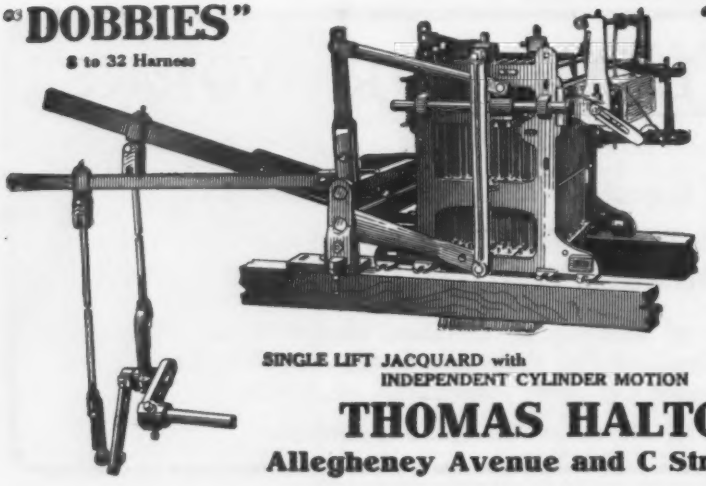

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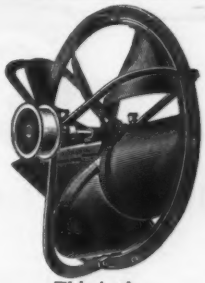

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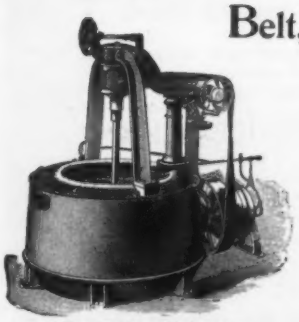

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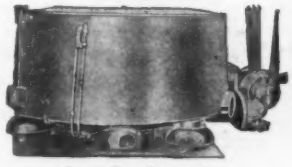

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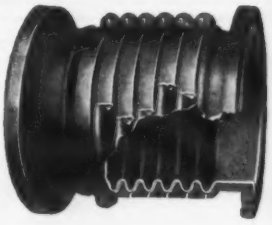

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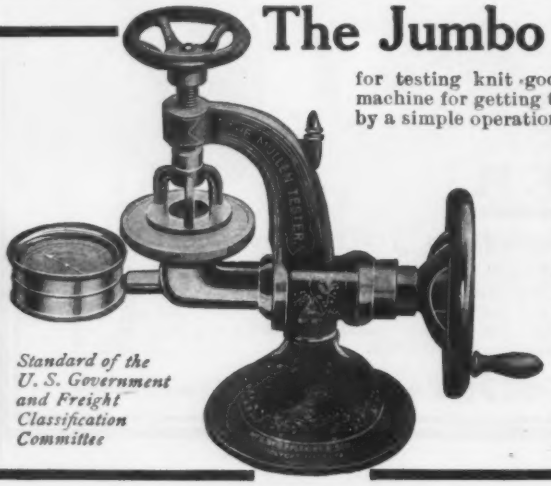

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TEXTILE WORLD RECORD

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Official American Textile Directory

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A Complete Directory of Cotton, Woolen, Knitting, Silk, Flax and Jute mills of the United States and Canada, together with the Dyeing and Finishing Works, Bleacheries, Print Works and other Textile Establishments; about 7,000 in all. Full information is given about each mill in almost every instance, viz., the name of the company or firm, names of officers, agent, superintendent, the character of goods made, the machinery equipment, i. e., the number of sets of cards (or combs), the number of spindles, number of looms; whether the mill uses steam or water power, whether there is a dye house or not, the names of the selling agents or if the mill sells direct. All this and much other information contained in this book is arranged in a way to be instantly accessible.

Vest Pocket Editions of the Directory are published in three sections, viz.; the New England States and Canada; Middle States; Southern and Western States. The price of these is **$1.00** per section.

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Published annually in a handy size for the pocket, $1.50

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THE KNIT GOODS TRADE. The Dry Goods Section of the American Directory of the Knitting Trade is also bound separately. It is pocket size, has flexible covers, and contains classified lists of manufacturers, manufacturers' selling agents, jobbers, department stores, large Retailers, and New York Buyers. Price **$1.00.**

Permanent Colors Create Permanent Trade

The insistent demand of the consumer for Fast Colors makes it imperative that the Retailer, the Jobber, the Cutter-up and Textile Manufacturers recognize the question, Fastness of Colors, as a most important one

Indigo The introduction of synthetic Indigo by the Badische Anilin-& Soda-Fabrik in 1897 greatly lowered its cost, simplified its application and placed it on a scientific basis. The immediate practical result has been that Indigo is used on an ever increasing scale in the production of overall goods (denims) for working garments worn by artisans of all classes everywhere, as well as for navy blues with white designs, in percales, and similar fabrics which are so largely used the world over for women's house and working dresses. Nothing has yet been found which is as well suited as Indigo for these and many other purposes, since it combines minimum cost, brilliancy of color and satisfactory fastness. In fact, the word "Indigo" to the consuming public is a guarantee of a durable and satisfactory color.

Indanthrenes Unfortunately, however, Indigo produces only a Blue, while the trade requires every shade in fast and brilliant colors. To Dr. Rene Bohn, Director of the Badische Anilin-& Soda-Fabrik, Ludwigshafen a/Rhein, should be given credit for the discovery of the series of dyestuffs derived from Anthracene, known as Indanthrene Dyes, which produce fast colors in every desired shade and tone. The introduction of these dyes in the cotton industry has created a new standard for fastness and brilliancy, in which combined respects they excel any colors heretofore known. Indanthrenes are actually permanent while the fibre lasts, meeting therefore every trade requirement, a fact so well demonstrated that today the word "Indanthrene" (pronounced In-dan-threne) is synonymous with "Fast Colors." There is probably no factor of greater importance in the manufacture of cotton goods than the fastness of the colors, in that it constitutes a most attractive selling argument, increases their popularity, and broadens the market for them.

BADISCHE COMPANY

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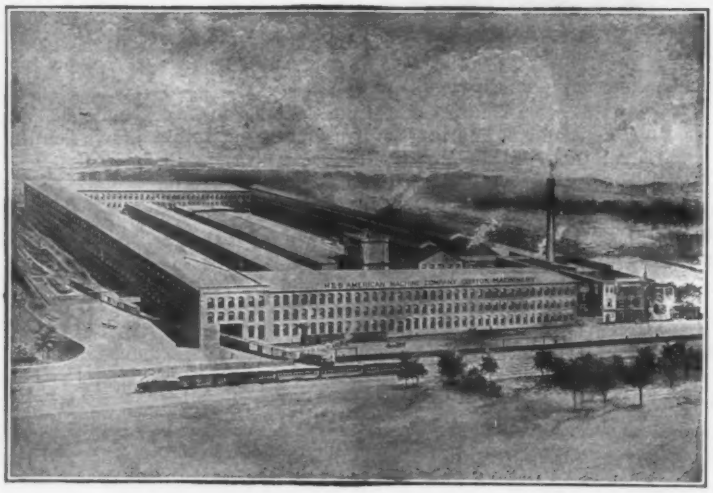
Correspondence

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

COTTON MACHINERY



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TEXTILE WORLD RECORD

Vol. XLIX SEPTEMBER, 1915 No. 6

Monthly Comment.

"Developing" a Dyestuff Industry

Dr. Thomas H. Norton and Dr. Maurice J. Langdon, two agents of the Bureau of Foreign and Domestic Commerce, have been conducting in New York City what they term an investigation of the dyestuff industry. Several days before their arrival in that city the press announced their coming, intimating that "some startling information relative to the dyestuff situation" would be obtained by the investigators.

With their arrival in New York on August 30 there began in the newspapers a series of almost daily press notices by Dr. Norton, the character of which is shown by a few excerpts:

Aug. 31. Dr. Norton was severe in his criticism of Americans who have been responsible for the wasting of $100,000,000 worth of by-products.

> "We are face to face with the one question of how America can develop a dyestuff industry rapidly and harmoniously," Dr. Norton said. "There is no doubt in my mind but that the industry can be established. America has the facilities and if there is a dormant Carnegie around, the industry can well be taken care of. We need the big men in the proposition."

Sept. 1. Dr. Norton yesterday appointed William Moore Springer, a Columbia graduate, as one of his assistants in connection with the investigation. He will work under Dr. Langdon.

> "Men representing businesses capitalized at $75,000,000 called today and indications point to the establishment of this bureau as a huge success," Dr. Norton said last night. "Men who have the capital and skill are taking a keen interest in the dyestuff industry."

Sept. 2. Dr. T. H. Norton, of the Bureau of Foreign and Domestic Commerce, here to investigate the dyestuff situation for the government, will be the guest of honor at a luncheon to be given shortly by the National Association of Ink Manufacturers. Dr. Norton has been asked to speak on the dyestuff manufacturing possibilities in this country.

Sept. 3. That domestic dyestuff manufacturers are greatly handicapped through the cornering of sulphuric acid by the manufacturers of high explosives who are filling immense orders for the Allies, was a statement made yesterday by Dr. T. H. Norton.

> "So serious is this matter of sulphuric acid that he doubted if the manufacturers of colors in this country would be in a position to continue on any reasonable scale throughout the winter months. The fact remains that the textile industries have been absolutely dislocated, thrown out of gear, more or less, and we mean to find out just where the trouble rests and what can be done to help matters," Dr. Norton said.

Sept. 4. At the close of a long interview with one of the officials of the corporation which has had its plants working in secret for some time, Dr. Norton made the announcement that the highest hopes are entertained for the solution of the dyestuff shortage through the discovery of a process novel in every respect and the work of American inventive genius.

Dr. Norton was enthusiastic over the proposition. He told the newspaper men around him that the discovery is of a revolutionary nature, and that he will probably make public all details of the plan at the convention of the silk manufacturers at Paterson next month.

> "From a standpoint of production, the discovery may revolutionize the art of

manufacturing dyes. We are on the brink of a revelation of the greatest importance. American chemists, backed by millions of dollars, have just called the attention of the bureau to their work which has been conducted very quietly and which means the supplying of a varied and very valuable set of colors needed so badly by the textile and other industries," said Dr. Norton, and added that it will mean the one important factor to free America from having to depend on other countries for colors it needs . . . . .

"The whole proposition has a satisfactory, technical foundation, and is conclusive proof of what American inventive powers can really do. Dyes made the American way, reliable in every detail, are certainly coming and we can all look for them. The products of the new corporation have been tested. There is one important feature, however, and that is no patents have been taken out, the chemists feeling confident their secret process will never be discovered. But I advised them, said Dr. Norton, "to get busy and take out patents and explained to them in detail why."

Among the callers at the office of Dr. Norton, in the Custom House yesterday, were several bankers from Wall street, who have been commissioned by wealthy clients to investigate the possibilities of making dyes in this country.

"Millions of dollars are ready for investment purposes," Dr. Norton remarked, "and we feel that the big factors are on their way."

Sept. 5. "I have been informed," said Dr. Norton, "that there is great possibility of a new natural red dye being shortly introduced. This, it is thought, will be of most interest to the paper trade, especially for the manufacture of tissue, blotting and cover papers and certain boards. It is a red dye of great fastness. The natural dyes of our country are numerous, but there are few pronounced reds.

"The new method of producing benzol and tuluol gives great promise and is the work of a New York scientist. It appears that by this method these chemicals can be manufactured and sold at a rate far below the price which prevailed previous to the beginning of the war."

Dr. Norton said in regard to the announcement made by him on Friday that an American had found a way to revolutionize the production of dyestuffs from coal tar, that the man was purely an American, with no German interests, connections or capital. He declined to tell who the inventor was, as he said such matters had to be carefully safeguarded.

The daily bulletins were not confined to the purely technical side of the dyestuff problem. On September 7 Dr. E. E. Pratt, chief of the Bureau of Foreign and Domestic Commerce, reached the dyestuff headquarters in New York and promptly gave the press a statement on the dyestuff tariff, exhibiting the same cocksureness that had been a feature of his subordinate's announcements. Ignoring the well-known fact that important grades of artificial dyestuffs are now on the free list, and apparently desirous only of sidetracking the tariff question in the interest of the professedly free trade administration that he is serving, Chief Pratt had this to say:

"The adoption of a higher tariff for dyestuffs is championed by manufacturers who desire to make higher profits and not by those who realize that it is entirely unnecessary for the protection of the trade. It is a fundamental fact of the industry that a 30 per cent. import duty is ample to guard American producers from foreign competition, and capital can be profitably employed without greater protection to make enough dyestuffs to supply the country. A few of the finer dyes are protected by patent, but, except for these, American manufacturers have everything ready at hand, favoring the expansion of the industry. Switzerland, with similar conditions, has built up production with practically no protective tariff, and the United States can also do so, with 30 per cent. protection."

The foregoing extracts are a fair sample of the voluminous announcements which Dr. Norton has made from day to day since his arrival in New York. At a time when the country faces the imminent danger of having vast industries paralyzed by a shortage of dyestuffs, when the need is for intelligent cooperation between the Washington administration and those in a position to aid in solving the problem, when it is of the greatest importance for the textile trade and the public to realize the seriousness of the situation, at such a time an agent of the Department of Commerce, announcing that he is to make a thorough investigation of the situation, proceeds to organize a publicity bureau in the metropolis, and to lend the authority and prestige of the United States Government to vague announcements regarding commonplace matters, to the pusillanimous longing for a trust magnate to save American industries, and to a sensational claim that a discovery which is to revolutionize the art of making dyes and free America from dependence on

foreign sources, a claim which, so far as the United States agent is concerned, is shown to be unwarranted by his own admission that the process is a secret and will remain a secret, and must for that reason be a mystery to him. Such are the methods of investigating the dyestuff situation by a Department of the Government which has plumed itself on its economy and efficiency.

Cotton as Contraband

The British Government on August 21, 1915, placed raw cotton, cotton linters, cotton waste and cotton yarn on the contraband. Cotton was omitted from the contraband list issued by Great Britain at the beginning of the war on August 4, 1914. On March 11, 1915, the British Government issued its Submarine Reprisals Order, which declared a general embargo on trade with Germany, not only in cotton, but all other products. In order to stop the shipments to Germany through Holland and other neutral countries, the doctrine of the continuous voyage was made to apply to such shipments when Germany was the ultimate destination. In order to separate legitimate trade with neutral Holland from trade with the enemy, the British authorities established in Holland a Netherlands Oversea Trust, to which all cotton carried to Holland had to be consigned, guarantees being required that none of the material should reach Germany. This arrangement is similar to that made with the Textile Alliance, by which the United States is able to import wool from Great Britain for use only in this country.

These methods have been open to two objections. Cotton in considerable quantities has been reaching Germany, while the application of the doctrine of the continuous voyage to non-contraband shipments to neutral countries was of doubtful legality and would in all probability be rejected if it came before an international arbitration board authorized to pass on the question of damages to neutral traders. Underlying these considerations was the controlling fact that cotton was not merely a textile material that could be used only in the manufacture of yarns and fabrics but was also one of the most important materials used in the production of explosives. The eminent chemist, Sir William Ramsay, at a meeting in London on August 11, called to consider the question, made this unequivocal statement on the use of cotton in the manufacture of munitions of war:

> Cotton is the only substance the Germans cannot furnish themselves with for propulsive ammunition. It is impossible for them to produce a substitute, and unless they use cotton they seriously interfere with the quality of their ammunition.
>
> If we stop cotton we stop this war. On the subject of importation into Germany through neutrals, I have had a letter from a Swiss boasting of the large profits he was making in importing cotton from Holland and exporting it to Germany. The pre-war stocks of cotton in Germany would have only carried Germany on for eight months.
>
> In spite of all that has been done by the Government and their promises to put difficulties in the way of cotton reaching Germany, cotton is still reaching the enemy, and we are still furnishing the enemy with means of killing our own soldiers and those of our Allies. We are contributing indirectly to the defeat of the Russian armies. This is grossly unfair to ourselves and to our Allies.

Such were the conditions under which the Allies on August 21 made cotton contraband of war. Following is the British proclamation:

> Now, therefore, we do hereby declare, by and with the advice of our Privy Council, that during the continuance of the war, or until we do give further public notice, the following articles will be treated as absolute contraband in addition to those set out in our royal proclamations aforementioned:
>
> Raw Cotton, Cotton Linters, Cotton Waste and Cotton Yarn. And we do hereby further declare that this, our royal proclamation, shall take effect from the date of its publication in the London "Gazette."

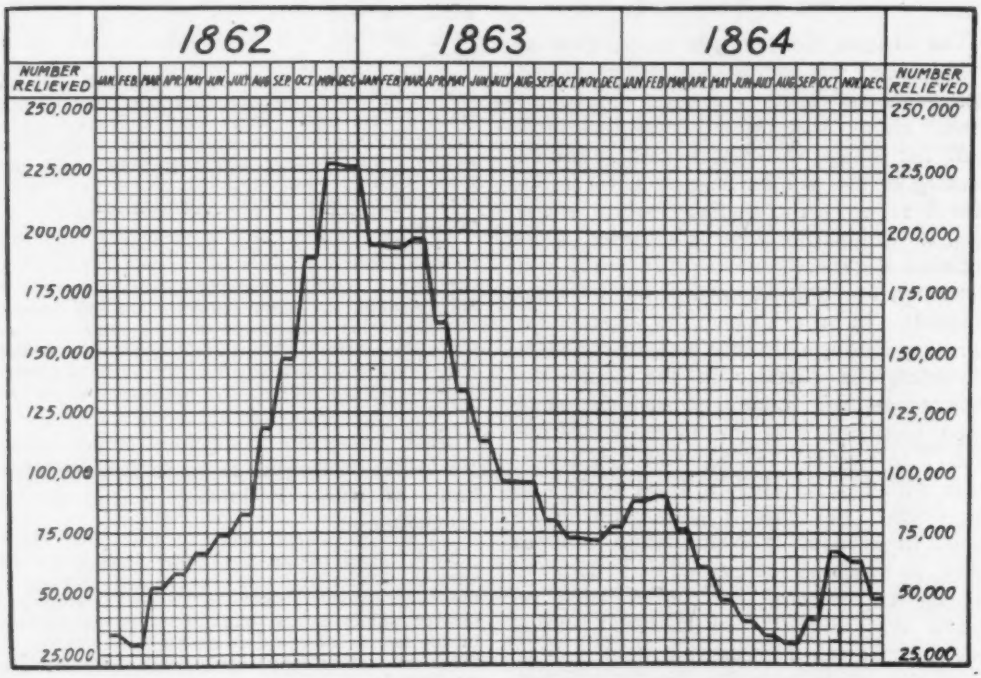
In making cotton contraband Great Britain has with evident reluctance taken a step in conflict with an hitherto unbroken record in regard to that staple, and a step that in future wars may be used to embarrass her. There is, however, no law which prevents a contraband list from being modified to meet new conditions, and the case against cotton as a raw material for explosives seems incontestable in 1915. Another reason for British delay in making cotton contraband was undoubtedly the desire to avoid anything cal-

culated to arouse antagonism in the United States. Discussing on August 12, the question of cotton as contraband the "Manchester Guardian" said:

Cotton was contraband in the American Civil War, and there was a famine here in consequence. But no one then in America proposed to buy up the cotton and sell it to starving Lancashire. We accepted it then as one of the fortunes of war, and our suffering did not make the least difference to the sympathies of Lancashire in that terrible time. We must do the Americans the justice of thinking them to be as unselfish as Lancashire was then. Let us see that our action is regular and in perfectly legal form. Let us recognize the overwhelming importance of maintaining good relations with the United States. Having done that, we confidently leave with America the judgment of our action, and we believe that that judgment will be as little influenced by pecuniary loss or gain as was that of Lancashire fifty years ago. Those who know America know that the mainsprings of her policy are not selfish, but ideal.

The point regarding the suffering of Lancashire during the cotton famine of 1861-65 is of such direct application now that it may be well to recall some of the circumstances of that period. The American embargo on cotton in 1861 resulted in great distress among English cotton operatives. John Watts, a member of the English Central Relief Committee, in his "Facts of the Cotton Famine" says:

The total number of persons chargeable at the end of November, 1862, was, under the boards of guardians, 258,357, and on relief committees, 200,084; total, 458,441; or 864 per cent. throughout all the unions more than were chargeable at the same period in 1861, and they were more even at that time than us al, for mills had begun to close in the September previous. But, as already stated, the average pressure gives no adequate conception of the real state of affairs, for average poor-rates could not be laid, but each township must bear its own burden.



THE COTTON FAMINE IN LANCASHIRE. FLUCTUATIONS IN THE NUMBER OF PERSONS RELIEVED BY PUBLIC CHARITY IN ASHTON-UNDER-LYNE, BLACKBURN, OLDHAM, PRESTON, ROCHDALE AND STOCKPORT

Here were nearly half a million of people, industrious, prosperous, and for the most part happy, suddenly struck as it were with paralysis, and rendered thoroughly helpless. Effort on their part was useless, for the cause of the disease was far beyond their reach, whilst the only safe remedy would require years of exertion, with a large expenditure of time and money, and meanwhile much and patient waiting and suffering must be endured.

In the month of December, 1862, the total numbers relieved were—by the guardians, 250,588; and by relief committees, 236,207—total 485,434 persons, or 24 per cent. of the whole population of the district.

The extent of and fluctuation in the distress in Lancashire at that time are illustrated by the accompanying chart, which shows the number of persons relieved by public charity in six manufacturing districts, Ashton-under-Lyne, Blackburn, Oldham, Preston, Rochdale and Stockport in 1862, 1863 and 1864. These districts with a population of 662,000 in 1861 had 227,600 persons, or over a third of the inhabitants supported by public charity in November, 1862. And in addition to these there were the large number aided by private charity.

This appeal for a generous consideration of the contraband order, which the English press make with such historical justification, was prompted by the expectation of the injury that the decree might cause to the American cotton belt. The conditions under which this contraband order goes into effect are such as to minimize its effect on the cotton trade. Germany and Austria, against whose trade it is aimed, take in ordinary times but a small part of the American cotton crop. For the year ending August 31, 1913, these two countries used 1,981,473 bales of American cotton, which was only 13 per cent. of the world's consumption (15,195,608 bales) of American cotton in the same year. The effect of the contraband order is also reduced by the delay in its appearance. Since the war began the cotton growers have been able to curtail production and it is estimated that the new crop of 1915-1916 will not amount to more than 12,000,000 bales, as compared with 15,100,000 bales last year, the decrease, 3,100,000 bales, being one and one-half times the total consumption of American cotton by Germany and Austria. Furthermore, the U. S. Treasury Department has announced its intention to deposit $30,000,000 in gold in Southern banks without interest to enable the banks to take care of loans on cotton. Under these conditions it is not surprising that the announcement of the contraband order by Great Britain has had practically no effect on the cotton market, less in fact than often results from reports of favorable or unfavorable weather in the cotton belt.

Trade Notice of Dyestuff Shortage

Last month the following notice regarding the dyestuff shortage was sent to their customers by M. C. D. Borden & Sons, New York:

After continued and thorough investigation of the dyestuff situation, we can state without fear of contradiction that the existing conditions are serious beyond explanation. and furthermore that there is not the slightest indication that there will be any relief for some time to come.

Our present supply of indanthrene color is sufficient to permit us to execute all orders that we now have on hand.

Refgrring to the unassorted balance due you on contract, we are fearful of our ability to give you the customary fast colors unless you favor us with specifications for the amount due at once.

Needless to say, this state of affairs is very annoying and disagreeable to us, and we regret the necessity of writing in this manner.

By complying with this request you will not only be materially assisting us but you will be taking advantage of the only available opportunity to protect your own interests.

We feel that you will realize the wisdom of giving this matter the consideration and attention it warrants, and therefore await your immediate reply.

The Laundrymen and a Merchandise Marks Act

For several years the delusion as to "pure textile" legislation has been persistently encouraged by influential laundrymen throughout the country. The obvious motive was to create popular prejudice against textile materials in order that the responsibility for damage to goods in the process of laundering might be shifted from the laundry to the textile mill. In pursuing this object prominent members of laundrymen's associations have supported the various absurdities that have appeared in Congress in the form of "pure textile" bills from time to time. During this campaign it became apparent, however, that the movement was instigated by a comparatively few men among organized laundrymen, the great mass of whom were reasonable men, having but slight knowledge of the "pure textile" question and who had been misled into sanctioning a program that was impossible in practice and calculated only to create prejudice against another trade. In view of this record it is particularly gratifying to find the Laundrymen's

National Association, at its Portland, Ore., convention in July taking action on the question of labeling textiles which shows plainly a recognition of past mistakes. The evidence came in the form of a report by J. Clair Stone, chairman of the fabrics committee and which is reported in the "National Laundry Journal" as follows:

Mr. Stone explained that it is sought to secure the enactment of a national law that will compel the fabric manufacturers to label their goods correctly, and that it is not the intent to try to secure a law to compel the manufacture of pure fabrics. He stated that when all fabrics are correctly labeled, people will know exactly what they are getting, and that if they buy adulterated stuff they will know it, and not think that they are getting first class stuff. The speaker submitted the following resolution, and it was referred to the Resolutions Committee:

"Whereas, the adulteration of fabrics by the addition of foreign materials to give weight or finish or both, such as the weighting of the silks, has become a common practice among manufacturers; and

"Whereas, the use of the fibers other than as indicated by the name of the material, such as cotton in linens, is now quite generally followed by the producers of textile materials; and

"Whereas, the marketing of one fabric under the name of another, such as mercerized cotton, sold for linen or silk, is getting more and more widespread along with the use of deceptive labels.

"Therefore be it resolved, that this Association respectfully directs the attention of the National Congress to the immediate necessity of a thorough investigation covering this entire matter, through the present Federal Trade Commission, to the end that, from the statistics and data collected, remedial legislation may be enacted; and be it further

"Resolved, that this Association, through its Fabric Committee, take such steps as are necessary to cause this investigation to be initiated."

Mr. Stone announced that assurance had already been given that Congress will act as suggested.

He said that the interest of laundryowners is that adulterated fabrics do not wash well and frequent claims for damages are returned by people who bought originally under the impression that they were getting "all-wool" or "all-silk," but were getting mostly short fiber cotton.

This report by the laundrymen's fabric committee is encouraging because it admits a need for information, but the mistake in the resolutions is the plan to refer the question to a commission. That would mean only delay. All the information required for framing the necessary legislation for the protection of the public is readily accessible. Congress should collect this information and enact a Merchandise Marks Act without delay.

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The New Iowa Idea

Last April we published an abstract from an address by C. E. Wry, secretary of the Iowa Retail Clothiers' Association, in which he discussed the serious situation resulting from the loss of the German supply of dyestuffs and the then threatened loss of our foreign supply of wool. After recommending that a working clause in the patent law and sufficient tariff protection be granted in order to make possible the establishment of a dyestuff industry in the United States, Mr. Wry took up the wool supply problem and urged that the retail merchants start a campaign for increasing the domestic supply of wool. At that time he said:

I believe if the retail merchants of this country would fully realize our country's dependent condition as regards wool, and would work along a systematic plan, and in connection with other bodies that are working to increase our domestic production of wool, that they being immediately in touch with the small farmers at all times could soon effect a complete relief. I have taken this up with the Iowa Agricultural Department at Ames, and also with the Iowa Wool Growers' Association, and with mill men, and can count on active cooperation from all of them.

The July Bulletin of the Iowa Clothiers' Association contains the following report on the progress of the "More Sheep in Iowa" campaign:

At the Convention last February, it was decided that The Iowa Retail Clothiers' Association should enter actively into a campaign to increase interest among the farmers of Iowa in the more extensive raising of sheep.

Results so far have been most encouraging. A number of members took the matter up through their Wool Merchants' Associations and Commercial Clubs on their return from the convention, and report progress.

During the past session of the Legislature, the State Fair Board asked for an appropriation of $40,000.00 with which to erect a more suitable building for the exhibition of sheep. Your Secretary appeared before the appropriations committee in support of this, and feels that the facts he presented acted materially in getting the appropriations. Twenty-five thousand dollars was set aside to build the first part of the building, and the balance for completing will be furnished when needed.

The Department of Animal Husbandry of the State Agricultural College at Ames has given us active support in our efforts to interest the Iowa farmer in the sheep industry.

This year, at the big general Short Course which is held yearly at the Ames School, one full day will be devoted to sheep judging. The prizes for this event will be given by our Association.

We have written to the clothiers in all towns where we know Short Courses are to be held this year, urging that any prizes they offer be confined to sheep. We urge those of you who are giving prizes at your County Fairs or Short Courses to do the same. Specify to your local committees that any prize you give must be awarded in some manner on sheep.

This course consistently followed by our members would do much to promote sheep raising in Iowa. There are now about 750,000 sheep in Iowa. We should have at least 3,000,000. Let's all do our share to bring it about. There is big money for the farmer in sheep raising. Prices are high now for both mutton and wool, and are sure to continue so for a number of years. Let's help to make our country independent of foreign supply of wool.

Contrary to the general belief, Iowa produces, right now, as fine wool as is grown anywhere in the world. Yes, the finest kinds of worsted wool, but not enough of it. You can help in the campaign for "More Sheep in Iowa."

The Iowa Retail Clothiers' Association has set an excellent example for the entire country and the campaign which has been inaugurated in Iowa with so much enthusiasm and common sense should be extended to every State in the Union suitable for the raising of sheep. Success will involve hard, systematic work for years, but the object, making the United States independent of the foreign supply of wool, will well repay all the sacrifices that may be required. The new Iowa idea should be made a national idea. Individuals, associations, State Governments and the national administration, putting to one side selfish interests and prepossessions as to free trade, should work together to bring about a state of complete preparedness in respect to the wool supply.

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Japanese Knit Goods for England

A report from Consul General Scidmore at Yokohama states that large orders for knit goods are being placed in Japan by British importers. Orders now in hand are said to amount to about $500,000. A large part of these orders are for ladies' underwear.

Sheep Raising in Oklahoma

Eleven hundred ewes were received at the stock yards in Oklahoma City on July 29. This would not be an event of sufficient importance to deserve special mention were it not for the fact that it represents progress in a State-wide movement to establish sheep raising on a large scale throughout Oklahoma. Representing such progress, the arrival of these eleven hundred sheep is an event of national importance, marking as it does, a practically, businesslike effort to develop a great industry and change a situation under which the American people are at the present time dependent on the government of a foreign country for wool for their clothing.

In the general clamor for preparedness for war, the fact should not be overlooked, that such preparation involves not only an efficient army and navy, but also a state of industrial independence, under which the country is able to produce the raw materials and supplies required for feeding, clothing and housing the population. Moreover, industrial independence is preparation, not only for war, but also for peace. These are the facts that make the Oklahoma movement of so much importance to the entire country. It was started by George L. Browning, president of the Southwest Reserve Bank, Oklahoma City, who writes us as follows:

It has been and is our opinion that the bankers have the only organization possessing the facilities to handle such a movement, and on this theory we have made arrangements to have a high grade class of sheep shipped here which will be reshipped to bankers over the State in carload lots, the bankers distributing the sheep in small bunches to the farmers of their respective communities.

The bankers and newspapers over the State are enthusiastically supporting the movement, the papers giving the matter publicity and the bankers doing personal work and financing the deal. When a banker advises his farmer to buy sheep and at the same itme offers to loan the farmer the money with which to buy the sheep, that advice has weight.

When inaugurating the movement to develop sheep raising, Mr. Browning distributed a circular to the farmers of his State, from which the following extract is taken:

Oklahoma farmers are producing more feed than can be eaten by the live stock now within the

state's borders. Much of this feed is rough feed that cannot be marketed unless fed, and the present loss because of wasted feed is almost incalculable. Because of lack of live stock to eat this surplus feed, the Oklahoma farmers are not realizing over fifty per cent. of what they should realize from the products of their farms.

On account of high prices and scarcity, it is almost impossible for the average farmer to get much of a start in cattle. Farmers must turn to some other kind of live stock or lose a large part of the profits from their crops. Sheep are the most profitable of all live stock, and there is hardly a farmer but what could buy from fifty to one hundred ewes, paying for them or securing the banker for a loan to pay for them. Our climate is of the very best for sheep, and the few farmers in Oklahoma having sheep report wonderful success.

A farmer pays $7.50 each for fifty high grade young breeding ewes, a total of $375.00 for the ewes. He pays $25.00 for one registered buck. Total cost of sheep, $400.00. With proper care, more than half of these ewes will bring twins and the other ewes at least one lamb each. Seventy five lambs, (a conservative figure) should weigh eighty pounds each on the fall market, and should sell for at least $9.50 cents per pound. (Spring lambs have sold as high as 12 cents on the Oklahoma City market this year). This would bring $7.60 each for the lambs, or a total of $570.00. The ewes will shear from eight to ten pounds of wool each and the wool should sell from 25 cents to 30 cents per pound. Say each ewe nets you $2.50 for wool, and you have $125.00 for this product. As sheep, especially good breeding ewes, are increasing so rapidly in value with all prospects for still greater increase, you can figure your ewes at the end of the first year worth as much as when you bought them. Now, let us see what we have:

Wool, from 50 ewes, sold in spring	$125.00
75 lambs, fall market	570.00
Old stock of sheep	400.00
Total	$1,095.00
Less original cost	400.00
Net profit for first year (Nearly 150%).	$695.00

THE FIRST LOT OF EWES RECEIVED AT OKLAHOMA CITY FOR THE DEVELOPMENT OF SHEEP RAISING THROUGHOUT THE STATE

With the exception of a little extra feed given to the lambs at fattening time, the sheep feed has cost the average farmer nothing. Fifty ewes on the average farm will more than pay for their keeping by cleaning the farm of all weeds, underbrush, etc., and by furnishing the farm with the richest fertilizer known. It is marvelous how sheep will improve the farm or pastures, eating almost every known variety of weeds. After your corn is in roasting ears, you can turn the sheep into the corn and they will eat the crab grass, weeds and lower leaves, without damage to the corn. The average small farm can keep from fifty to one hundred ewes on what usually goes to waste. On pastures, you can keep ten sheep where you could keep one cow; on weedy pastures you can keep more than ten to one.

Sheep should be placed under fence at night

where there is any danger of coyotes or dogs. However, if a farmer desires to fence his whole farm with sheep fence, the cost will not be large. A 32-inch woven wire, with two barbed wires at the top, makes a strong sheep fence. It would cost about $200.00 to fence a full 160 acres with the above fence, but, of course, an eighty or forty acre tract would cost much less.

Sheep should not be housed, as they do better when left in the open. If lambs are dropped in early spring, they should be kept in a warm place until they are about twenty-four hours old.

The ewe should be bred so the lambs will come in March or April unless one desires to market the lambs real early, then the lambs should come in January or February. The period of gestation is 150 days.

Sheep are not subject to diseases like hogs. They are considered about our most healthful domestic animal. The death loss percentage is very small.

Ewes are good until they are from seven to ten years old. As soon as they begin to lose their teeth they should be fattened and marketed, and replaced with young ewes.

On the Oklahoma farm the most profit will come from a combination mutton and wool sheep. An ideal sheep for this purpose is a Rambouillet ewe crossed with a good registered Shropshire buck. You are then assured of the highest price mutton, as well as a fine grade and good shearing of wool.

The Government report for January 1st, this year, showed the number of sheep in the States mentioned as follows: Missouri, 1,490,000; Texas, 2,114,000; New Mexico and Arizona, 5,101,000; Indiana, 1,114,000; Iowa, 1,249,000, and many of the other States showed from two to four million. Oklahoma, according to the Government report, had only 76,000; a mere bagatelle. We should, and must, have a million.

As the bankers helped the farmers get a start in kafir, so they can help the farmers get a start in sheep raising. But in a movement of this kind the bankers and farmers must cooperate, as they should in all movements for the betterment of their community. I suggest that the banker, as a leader, get the farmers together and then for each farmer to agree to handle a certain number of ewes until they have subscribed for a full car or more. A car will hold about 300 ewes. After the banker has a car subscribed, he can then take the steps to have the ewes shipped in.

As we are just starting in the sheep raising business in this State, now is the time to protect ourselves from an inferior grade of sheep. That we may be assured of only the highest grade of ewes, and only young ewes, it will be necessary to have each and every ewe inspected by a sheep expert.

Let us all work to put the Oklahoma farmer on a financial par with the farmers of our sister States. Nothing will do it as quickly as sheep raising.

The value of the exports of woolen goods to the United States during last year was $3,418,000, against $2,379,000 for 1913.

The Tariff on Dyestuffs

A recent issue of the Journal of Industrial and Engineering Chemistry contained an article on the history of the tariff on coal tar dyestuffs, by Bernhard C. Hesse, of New York, which makes interesting reading in connection with the events since the beginning of the Great War in August, 1914. Mr. Hesse has industriously compiled a large number of extracts from the testimony on the dyestuff tariff before the Tariff Commission of 1882 and various Congressional Committees since that year, showing how earnestly American manufacturers of dyestuffs have appealed for protection to their industry and how this appeal has met with the opposition of the consumers of dyestuffs. Probably the most interesting part of the abstract of past testimony is the protest against the duty on coal tar colors and dyes, which was presented to the Committee on Ways and Means on December 20, 1908, by seventeen companies, including some of the leading cotton goods printers and manufacturers of the United States. It is the irony of fate that the first name among these signers is that of the Amoskeag Mfg. Co., F. C. Dumaine, Treasurer, Manchester, N. H., a company whose selling agents, Jarvis & Prankhard, New York, sent the following notice to the trade a few weeks ago:

> Owing to the dyestuff situation over which we have no control it will be necessary for us to curtail our entire product, commencing Aug. 16.
>
> We have your order of . . . . . for . . . . cases of Amoskeag 19,000 Range Chambray, and we regret that on account of the above conditions we will be able to record only . . . . cases on your order for delivery during the period for which the goods were offered. The balance of your order . . . . cases, we will record at value if satisfactory to you, for future delivery if possible.

We give below a portion of Mr. Hesse's article and the accompanying extracts from the tariff testimony:

LEST WE FORGET. WHO KILLED COCK ROBIN?

THE U. S. TARIFF HISTORY OF COAL-TAR DYES

In 1914 the textile industry said to the chemists of this country:

> "The appeal of the textile industry to the chemist at present is: 'We need dyestuffs, so get busy and make them; don't

hem and haw, and make excuses, but get right on the job."

Again in 1914 the dye-users said to the chemists of this country:

> "Users of dyestuffs in quantity are more or less indignant over the fact that manufacturers in this country are dependent upon other countries, and Germany particularly for the dye supply. They ask: 'Why haven't our chemical companies experimented sufficiently to produce synthetic dyes, pharmaceutical products, essential oils and synthetic perfumes, in the production of which Germany seems to have had almost a monopoly?'
>
> "The users of dyestuffs say that the General Chemical Company, with its cash resources and its extra cash and stock dividends yearly, and other companies in a similar position, ought to have had sufficient initiative to use a portion of their large profits in experimental work, which would have permitted us to manufacture synthetic dyes without recourse to other countries, and would not have permitted American manufacturers to suffer severely when imports were checked by the war. They state that the interests of manufacturers of the country should have been placed ahead of large immediate profits and unusual dividend returns to stockholders."

In view of these statements the following excerpts from the official reports of the various Tariff Commissions and similar committees, from 1882 forward, are not without present day utility and interest.

These excerpts show beyond doubt that practically every argument advanced in 1914 as to why coal-tar dyes should theretofore have been made in this country, was previously presented to Congress in support of the view that they should be made here.

These excerpts are here presented in the hope that careful study of them by the chemists of this country will pave the way for tariff treatment of coal-tar products, inclusive of dyes, on as nearly a fair and equitably economic basis as all the circumstances may require.

The hearings of 1913, both before the Committee on Ways and Means and the Senate Finance Committee were of the same general tenor as the statements just given.

The duties on coal-tar dyes in the different tariff revisions were:

1864. Anilin dyes $1.00 per lb. and 35 per cent.
1870. Anilin dyes 50c. per lb. and 35 per cent.
1883. Anilin dyes 35 per cent. Alizarin, free.
Anilin oil and salts, free. Indigo, free.
1890. Same as 1883 with alizarin dyes added to Free list.
1894. Coal-tar dyes, 25 per cent.
Alizarin dyes and indigo, free.
Anilin oil and salt, free.
1897. Coal tar dyes, 30 per cent.
Alizarin dyes and indigo, free.
Anilin oil and salt, free.
1909. Same as 1897.
1913. Alizarin and alizarin dyes, free.
Indigo and indigo dyes, free.
Anilin oil and salts, toluidin, xylidin, etc., 10 per cent.
Coal-tar dyes, 30 per cent.
Carbazol dyes, free.

It is therefore clear, in the light of the above tariff enactments that the preceding arguments of dye-users against suitable tariff-enactment on coal-tar dyes so as to enable their manufacture in this country, were more persuasive with Congress than the arguments of domestic dye and chemical makers on behalf of such favorable tariff-enactments.

Will the awakening of the American public since August, 1914, alter this situation?

EXTRACTS FROM TESTIMONY—REPORT OF THE TARIFF COMMISSION, 1882

John Campbell of J. Levinstein, Campbell & Co., New York City, manufacturers of aniline dyes: We are importers and manufacturers of aniline dyes. We pay from 5 to 300 per cent. duty on the different articles which we import. I am in favor of the free importation of these goods, but still, if a duty be requisite for revenue, then I say make it ad valorem instead of specific and ad valorem, as the fifty cents per pound alone means upon some of these dyes 240 per cent duty, while upon others it means only 5 per cent.

H. K. Lansing, Treasurer Albany Aniline Chemical Works, Albany, N. Y.; The manufacture of colors (aniline) commenced in this country, we think in 1866, by T. and C. Holliday, who subsequently sold out to the Albany Aniline and Chemical Works, a company incorporated in April, 1868, with a capital of $25,000, and increased to $100,000. After expending all their capital on machinery and experiments in the manufacture of fine aniline colors, they reduced the capital to $25,000, and confined their attention to the production of aniline red until about two years ago, when new premises were purchased and some $60,000 expended for machinery. Chemists were brought from Switzerland and England, and we are now engaged in the manufacture of all the fine aniline blues and expecting ere long to make all the finer colors made in Europe.

The only objection that has been or could be made to that (letting the foreigner make our dyestuffs) would be that if we got into a war with some of the European countries we should be at a disadvantage in regard to these colors. I suggest that as a very contingent and remote disadvantage; that the probabilities of such a war are insignificant. These goods are made not only in England but in Germany, and if the worst came to the worst, and we were cut off from our European supplies, we could fall back on the vegetable dyes that came from South and Central America before aniline dyes were invented.

J. F. Schoellkopf, Jr., manufacturer of aniline dyes, Buffalo: In addition to my communication of July 27, 1882, I desire to call your attention to the following circumstances: Coal tar is procured from bituminous coal; benzole, the raw material for aniline oil, is gained from coal tar by distilla-

tion. Now, benzole pays a duty of 40 cents per gallon, whereas aniline oil comes in free. The facts certainly must have been misrepresented at the time the present tariff was framed, for it is evident that if the raw material, benzole, is protected and manufactured article, aniline oil, is justly entitled to the same privilege. Aniline oil, which is used directly for printing black (on cotton) cannot be manufactured as cheaply here as in Europe, owing to higher labor and high prices for acids (sulfuric and nitric acids) used in its manufacture. I have learned that New York and Boston parties are circulating a petition among the larger consumers of aniline dyes, with the intention of reducing the duty on such dyes to 25 per cent. ad valorem only. This would leave domestic manufacturers virtually without protection. We must have an absolute protection, and this can be realized only by a specific duty. I would suggest the raising of the specific duty 25 or 50 cents per pound and dropping the ad valorem duty altogether. This would enable home manufacturers to compete with foreign producers. The president of the largest manufactory in Europe, the Badische Aniline Factory of Mannheim, told me personally that if the duty was not taken off they would be obliged to start factories over here. I think that shows that the price today in this country is as cheap as it can be. They make almost all the known colors. Dyes can be made here, in time, as cheaply as in Europe; but we must have a chance to start the business.

A. Klipstein, New York: I would recommend putting upon the free list every dyestuff and chemical used in dyeing, calico printing, etc., and every chemical used in making paper, soap and glass, in bleaching and other industries. These articles may be fairly classed as raw material for the use of these industries. If these various industries could get their dyestuffs and chemicals free, the saving to them would be so considerable that they would be upon a much better footing for competing with the foreign manufacturers, and it would lead to a large increase of the export trade in their products. Aniline dyes and colors should be made free. They pay now the enormous duty of 35 per cent ad valorem and 50 cents per pound. At the time the tariff was framed these colors were comparatively little known, and their importance not recognized. Their price was at that time very high, and the 50 cents per pound specific duty was not felt so much. Since then great progress has been made in the manufacture of these dyes, the prices have been very considerably reduced and large quantities are used.

BEFORE THE COMMITTEE ON WAYS AND MEANS, 1896-7

The Heller & Merz Co., The Schoellkapf Aniline and Chemical Co., and the Hudson River Aniline Color Works: The tariff of 1890 left the domestic coal tar dye manufacturer in a very unfortunate position, with the duty of 35 per cent. on the colors, and 20 per cent. on coal tar preparations, which constitute a large percentage of the raw material for the colors. This, in addition to the higher prices we are compelled to pay for labor and other domestic chemicals, precluded any real progress of the American manufacturers in their struggle against the aggressive competition of the well-equipped German factories. The Wilson bill placed the coal tar preparations on the free list, but by reducing the duty on colors to 25 per cent. did not improve the position of the domestic makers. We feel confident that the slight increase asked for which makes the rate what it was under the tariff act of 1883 and 1890, will enable us with the experience we have gained under adverse circumstances and with the great domestic progress in scientific chemistry, to successfully compete against the imported goods and in time supply the home market.

BEFORE THE COMMITTEE ON WAYS AND MEANS, 1908-9

Mr. Shoellkopf, representing the Shoellkopf, Hartford Hanna Company of Buffalo, N. Y., and the Heller & Merz Company of Newark, N. J.: The undersigned repectfully request that at the impending revision of the tariff the minimum duty on coal tar colors and dyes be increased from 30 per cent. to 40 per cent. ad valorem, and that all coal tar products and preparations not colors or dyes used in the manufacture of these dyes be placed on the free list. In submitting this request we do so with the understanding that it is the intention of Congress so to adjust import duties as to give the domestic manufacturer adequate protection against his foreign rival, or, in other words, the duties imposed shall cover the difference in cost of the article protected when made in America as against the same article when made abroad. In asking for free entry of all coal tar products and preparations used in the manufacture of coal tar colors, no American industry will be injured, as these articles are not made in the United States, nor can they be manufactured profitably under existing conditions.

At a meeting of the firms interested in and dealing in "coal-tar colors or dyes" and "coal-tar products not colors or dyes, not otherwise specially provided for," held here today (Nov. 20, 1908) the following resolution was unanimously adopted:

Resolved: That we, the undersigned, protest against any increase in the duties on coal-tar colors or dyes, not otherwise specially provided for, and request an opportunity to be heard individually at such time and such place as is convenient to the committee of Congress.

H. A. Metz & Co., H. A. Metz, President.
Cassella Color Company, G. W. J. Matheson.
Badische Company, Adolf Kuttroff, President.
Farbenfabriken of Elberfield Company, Y. Rellmerling, President.
A. Klipstein & Co., G. O. Klipstein, Treasurer.
Berlin Aniline Works, E. O. Patz, Second Vice-President.
Geigy Aniline & Extract Company, Alfred Kublein, Vice-President.
Walter F. Sykes & Co., Jno. A. McGuire, Attorney.
Geishenheimer & Co.
C. Bischoff & Co.
Kalle & Co. (incorporated), Wm. Junker, Secretary.

Protest in Opposition to any Advance in Duties on Coal-Tar Colors and Dyes.

Washington, D. C., Dec. 20, 1908.

Gentlemen: Your memorialists, cotton manufacturers, consumers of coal-tar dyes for the coloring of various cotton fabrics (the largest consuming industry of coal-tar dyes in the country) respectfully submit:

First. We desire to protest against any advances in the rates of duty on coal-tar dyes or colors under section 15 of the present tariff on the ground that such advances would:

(a) Increase the cost of manufacturing colored cotton goods in the United States.
(b) Increase the price to the consumer in the United States.
(c) In the case of export trade an advance in the cost of any of our raw materials adds to our burden and minimizes our opportunity to compete with foreign cotton manufacturers in foreign markets.

Second. We further petition that, for the same reasons, alizarines and dyes derived from alizarin and anthracene, as well as indigo, be left upon the free list, and that no change be made in the following schedules now on the free list:

Section 468. Alizarine, natural or artificial, and dyes derived from alizarine or from anthracene.

Section 580. Indigo (meaning vegetable and synthetic).

Very respectfully,

Amoskeag Mfg. Co., F. C. Dumaine, Treasurer, Manchester, N. H.
Hamilton Mfg. Co., Franklin D. Williams, Assistant Treasurer, Lowell, Mass.
Pacific Mills, Edwin F. Greene, Treasurer, Lawrence, Mass.
Massachusetts Cotton Mills, Edward Lovering, Treasurer, Lowell, Mass.
Merrimack Mfg. Co., Herbert Lyman, Treasurer, Lowell, Mass.
Cocheco Mfg. Co., H. DeF. Lockwood, Treasurer, Dover, N. H.
American Printing Co., B. H. Borden, Treasurer, Fall River, Mass.
The United States Finishing Co., J. H. Wright, President, New York.
The Apponaug Co., J. H. Wright President, Apponaug, R. I.
Garner & Co., Oscar Hutley, Vice-President, Pleasant Valley, N. Y.
Passaic Print Works, Edward E. Poor, Treasurer, Passaic, N. J.
Arnold Print Works, W. A. Gallup, Treasurer, North Adams, Mass.
Windsor Print Works, D. A. Russell, General Manager, North Adams, Mass.
Renfrew Mfg. Co., Ira S. Ball, Assistant Treasurer, Adams, Mass.
Queen Dyeing Co., B. J. Horton, Treasurer, Providence, R. I.
S. H. Greene & Sons Corporation, Francis W. Greene, Treasurer, River Point, R. I.
The Aspinook Co., L. Johnson, Treasurer, Jewett City, Conn.

The European Situation

COTTON YARN PRICES IN GERMANY

The growing scarcity of cotton in Germany since the war began is shown by the high prices for cotton yarn. The following quotations are for yarn at M. Gladbach, on July 17, 1914, two weeks before the declaration of war, and on July 9, 1915, nearly a year later. Prices are given here in cents per pound:

	July 17 1914.	July 9 1915.
12s Ring	19	37¼
16s	19½	37⅝
20s	20⅛	38½
24s Warp	21⅛	39⅜
16s	20⅝	39½
20s	21⅜	40⅜
12s Cops	18⅛	36⅞
16s	18½	37¼
20s	19¼	38
24s	20⅛	38¾
4s-6s India Cotton	14⅜	33½
8s	14½	33¾
10s	15	34⅛
12s	15¼	34½

"The Wochenberichte der Leipziger Monatschrift fuer Textil-Industrie" of July 14, 1915, from which the above quotations for July 9 are taken, states that, owing to the recent order forbidding the manufacture of cotton yarn and cloth in Germany, quotation for yarn and cloth at the Suttgart Bourse have been discontinued.

A NATIONAL INVENTORY OF UNSPUN WOOL

The German Government recently ordered that an inventory of stocks of unspun wool remaining in Germany be taken June 30, 1915. All persons having such materials in their possession or under their control were required to make a report of the quantity and quality under severe penalties for false statements or delay in filing reports. The following materials were included in the inventory: Unwashed wool, scoured and carbonized wool, tops, noils, wool waste and shoddy.

FORBIDDING THE MANUFACTURE OF COTTON GOODS

The German military authorities have forbidden the manufacture of many kinds of cotton goods, this action being based on law

relating to a state of military siege. The cotton goods which can no longer be manufactured in Germany without permission from the Government include the following articles:

1. Underwear and sheeting for which yarn under 16s or over 32s is required. Also goods requiring more than 5 shafts in weaving.

2. Table cloths, napkins, handkerchiefs, scrubbing cloths, dust cloths and bed-ticking.

3. All dress and lining fabrics for which yarn under 16s or over 32s is required, without regard to the threads per inch. Also all goods requiring more than 5 shafts in weaving. Embroidery fabrics, netting, bobbinet, laces, veilings and fringe.

4. Mattress ticking, bed covers, wall cloths, tapestry fabrics, upholstery drilling, stair-carpeting, upholstery stuffs, table covers, portieres, creton, madras portieres and curtains of all kinds.

5. Bags, belting, rope, twine, cylinder covers, strainer cloths and cheese cloth.

6. Ribbon, tape, webbing and passementerie.

7. Knit goods of all kinds.

The order, which is signed by Generals von Broizem and von Schweinitz, states that any violation of its provisions will be punished by imprisonment for one year unless the law provides a more severe penalty.

GERMANY SEIZES SILK AND REGULATES ITS USE

The latest step by Germany in taking control of the manufacture of textile materials is the seizure of all stocks of raw silk in the country and the issuance of an order forbidding the manufacture of silk goods for other than military uses. The "Wochenberichte Leipziger Monatschrift fuer Textil-Industrie" gives the following report of the new silk regulations:

This order is published for the information of the public and any disobedience of its provisions or any incitement of disobedience by others will be punished under the laws provided for such cases. The regulations will go into effect on July 15, 1915.

The working of raw unspun bourette silk and undyed bourette yarn in all numbers is forbidden except for military purposes. The dyeing process is included in this prohibition. The working for military purposes comes under the following heads:

1. The working of raw unspun bourette silk into undyed yarn which is intended to be used in filling orders for the War Department.

2. The working of undyed yarn into such fabrics as may be used for powder sacks and which are intended for filling orders given by the War Department. The working of silk for military uses will be permitted only when an official certificate of such permission is given to the manufacturer.

3. Any old orders that are not filled on July 15 can be completed only by obtaining a certificate of permission from the military authorities.

Materials subject to this order include the following:

1. Raw unspun bourette silk.
2. Undyed bourette yarn of all numbers.
3. Raw unspun silk suitable for the manufacture of schappe silk.
4. Schappe silk yarn in singles up to 100s and in 2-ply up to 200/2.
5. Raw unspun tussah silk.
6. Raw undyed tussah silk in all numbers.

All persons, firms and corporations having in their possession or under their control silk as described above, are required to make a report of the quantity to the military authorities not later than July 31, 1915.

A CRISIS IN THE GERMAN COTTON INDUSTRY

The Dresden correspondent of the "Leipziger Neue Nachrichten" gives a report of the serious situation in the Saxon cotton industry, which has resulted from the military regulation forbidding the manufacture of cotton goods:

The Saxon Minister of the Interior, Count Vitzthum von Eckstaedt, gave an audience yesterday to a delegation headed by the chief burgomaster of Chemnitz, Dr. Sturm, in regard to the threatened suspension of operations in the textile industry as a result of the order forbidding the manufacture of cotton goods. The Saxon Government is expected to adopt all possible means to prevent or at least to mitigate the expected blow to the Saxon cotton industry. The Minister of the Interior stated that the government has already taken the problem under consideration and that they would do everything to afford relief to the industry. In the Chemnitz district not less than 30,000 textile operatives will be affected by the threatened shut-down. Another deputation from the Saxon Chamber of Commerce waited on the Government and made representations regarding the situation. The reply which the authorities made was to the effect that the Ministry of the Interior would exert every effort without delay to secure a modification of the order prohibiting the manufacture of cotton goods. It is to be hoped, therefore, that the threatened shut-down of the cotton mills which is expected in the next two months will be avoided.

The gravity of the cotton problem in Germany is indicated by the fact that the mili-

tary authorities at Berlin have made some slight modification of the regulations forbidding the manufacture of cotton. The new order amending the original decree makes exceptions of the following products:

(a) Yarn which is found in the mill where it was manufactured or is being subjected in outside establishments to other processes, such as twisting, dyeing, printing, etc., for the mill making the material.

(b) Yarn which was manufactured on order given previous to the date of the official regulations of the cotton industry, providing the order was taken for delivery previous to July 12.

(c)In mills operating both spinning and weaving machinery, yarn put in process of manufacture previous to July 12, 1915, for delivery to the weaving department.

ENGLISH WEIGHTS AND MEASURES IN GERMANY AND AUSTRIA

The use of English weights and measures in the textile industry has been particularly galling to Germany and Austria since the war began. While foreign fortresses were crumbling under the fire of 42-centimeter guns, and despite the intense agitation for the suppression of everything English, the cotton trade of the two allied empires has given a remarkable object lesson as to the permanence of established standards of weight and measure, by continuing to use the yard, inch, pound and English cotton system of yarn numbering in the manufacture and sale of yarns and fabrics. Even the military authorities in their proclamations ordering the seizure of stocks of textile materals, forbidding the manufacture of goods without official permission, and regulating the production of yarn and cloth for army use, have made free use of the English standards as the basis for textile specifications. Nevertheless, from the passions aroused by the war there has developed in all parts of Germany and Austria a fixed determination to abolish the use of English weights and measures. If the attempt to make the metric system the textile standard for Germany and Austria should fail when made under present conditions, it would seem as if even the most enthusiastic of metricites would be forced to admit the impossibility of the task in English-speaking countries.

The earnestness with which German and Austrian textile manufacturers are taking part in this pro-metric and anti-English movement is well expressed by Franz Feidler, manager of the cotton yarn mill of Jos. Riedel, Wurzelsdorf, near Tannwald, Bohemia, in a recent issue of "Oesterreichs Wollen und Leinen Industrie." With characteristic thoroughness Herr Fiedler treats the subject in detail under two heads; the first covering the technical difficulties; and the second, the changes that will be necessary in domestic and foreign trade. In more peaceful times, his portrayal of the difficulties will be proof of the impossibility of the change. We will not reproduce the technical part of the Austrian article now, as the American textile trade is familiar with the obstacles, but will give the general comments by Herr Fiedler. The force with which he urges the adoption of the metric system as a means for developing German and Austrian trade in international competition should make those pause who have been accustomed to urge the same step as a means for developing the industries and trade of English-speaking countries:

I am glad to give my views regarding the possibility and probability of introducing the metric system of numbering into the cotton spinning industry of Germany and Austria after the war. Compared with the important advantages to be gained, the difficulties involved in the introduction of the metric system of yarn numbering in cotton spinning mills are extraordinarily small and easily overcome. These difficulties do not relate to conditions in the distant future, but result from the disinclination of many interests to learn new ways and to put up with some inconvenience during the transition period.

The various spinning mills cannot, single-handed, compel a solution of the problem. In order to start the introduction of the metric system of yarn numbering in full swing the various associations of German and Austrian cotton spinners must apply themselves resolutely to the task. It will also be necessary for the various States to enact laws directed to this end. Moreover, I want to direct attention to the German and Austrian textile manufacturers and textile machine builders to another feature of the situation. Heretofore, a large part of the machinery used in cotton, woolen and worsted spinning and nearly all of the machinery used in the spinning of bast fibers has been built in England.

I have had opportunity to examine nearly all the textile machine shops in England, Germany, Austria and Switzerland and during a period of more than thirty years have had practical experience in the operation of nearly all of the different types of machines built in the large textile ma

chine works of Europe. As far as design and workmanship are concerned the spinning machinery built on the Continent is but little surpassed by the products of English machine shops. Indeed, the German and Austrian machines used in two-roll spinning and in worsted spinning are far superior to the English machines.

There have been two principal reasons for the enormous importation of English textile machinery into Austria and Germany in the past. As a result of the division of labor down to the smallest details, and of the perfection of machine tools and working methods, the English, in spite of a higher wage scale, have been able to build textile machinery cheaper than has been possible in the Continental shops. The German and Austrian spinners have naturally taken advantage of the lower prices, even when they were convinced that the Continental product was in no wise inferior to the English. Furthermore, the productive capacity of the Continental spinning machine builders has not kept up with the demand and under these conditions it has been impossible to free the home market of English competition. After the world war ends the lever must be applied and the iron must be forged while it is hot. The textile machine works of Germany, Austria and Switzerland must be greatly enlarged. The machine tools and working methods must be developed and perfected and the division of labor must be extended in accordance with the English example so as to apply to the smallest affairs. If this development is too slow in the already established machine works, the spinning and weaving interests in the three countries above named should see that the necessary capital is quickly provided for new enterprises. This course is necessary because later, after the lapse of a few years, when the animosity over the perfidious methods of the English, the instigators and promotors of this world conflagration, has cooled, it will be far more difficult to obtain thoroughgoing results. If, however, the established spinning machine builders rapidly enlarge their works in order to increase the production of machines of the present style, they will naturally exert themselves in every possible way to market their products in their own countries. Naturally I am far from believing that it is desirable and profitable for Germany and Austria to erect a Chinese wall against the importations from Great Britain and I am thoroughly convinced that reprisals from the other side of the English channel would cause great damage to our industry, but do we not hear the slogan from all parts of the four nationals allied against us: "Away with the industrial products of Germany and Austria?" And should the German and Austrian textile machine building industry neglect the opportunity to accomplish such enormous progress, an opportunity that is offered now, but which may never again return? Not only must this excrescence which in the form of the English system of yarn numbering hangs to the German and Austrian spinning industry, be cut out after the end of the world war, but German and Austrian capital must employ all means to substitute their own equally good products for English textile machinery.

INCREASED PRICES FOR GERMAN PRINT CLOTH

The Association of German Print Cloth Manufacturers, Leipzig, Germany, announced on July 28 that the firms included in the membership would increase the price of print cloths 10 per cent. in addition to the advance of 20 per cent. made some months ago.

ADVANCE IN PRICES FOR TEXTILE MATERIALS

A recent issue of the "Wochenberichte der Leipziger Monatschrift fuer Textil-Industrie" reports the following advances in prices of textile materials in Germany and Austria:

The associated German manufacturers of knitting yarn have announced an increase of 50 pfg. per kilo (5 1/4 cents per lb.) above the April list. The German Association of Velvet Manufacturers has advanced the April quotations 10 per cent. The German cotton goods wholesalers have advanced the prices of their goods 15 per cent. The Association of German Cotton Finishers have announced a further advance of 10 per cent, now amounting in all to 30 per cent. According to the Neue Freie Presse of Vienna, the Austrian cotton weavers have advanced the price of their goods from 25 to 30 per cent. and given notice that a further advance is in contemplation because the price of yarn has increased 150 per cent. and wages from 25 to 40 per cent. since the beginning of the war.

GERMAN WORDS IN TEXTILE INDUSTRY

The committee representing the German Language Association and the German Retailers Association which was appointed some months ago to compile a list of German words to be substituted for the non-German expressions current in the textile industry has concluded its labors and preparations are now being made to publish the list of over 1,000 words for the guidance of the public.

SHODDY AND COTTON FOR AUSTRIAN ARMY GOODS

The scarcity of wool has forced the Austrian military authorities to change the specifications for army cloth so as to allow the use of 50 per cent. of shoddy and cotton in goods formerly made of all new wool. The order is reported by the "Oesterreichs Wollen und Leinen Industrie" as follows:

Owing to the conditions in the wool market during the war the Austrian Ministry of War has issued the following notice:

Clothing materials which formerly were made of new wool are in the future to be manufactured of the following raw materials:

1. At least 50 per cent. of new wool.
2. From 10 to 15 per cent. of American cotton, not under middling.
3. From 30 to 35 per cent. of shoddy, which, however, must be of the best selections of the following grades: (a) knit rags, new worsted and new thibets; the quantity is limited only by the proportions named above. (b) New rags from field gray or light gray German or Austrian cloth, and not over 8 to 10 per cent of old rags from light gray Austrian cloth. (c) Rags from fine and coarse thibets, old worsted yarn and old flannel, not over 4 to 5 per cent. The use of card waste or felted rags (mungo) is forbidden. The cloths manufactured in accordance with the above specifications must be made in the following weights:

Mantle cloth, 840 to 890 grams per meter (27 to 28.5 ozs. per yd.)

Trouserings, 790 to 850 grams per meter (25.3 to 27.2 ozs. per yd.)

Cloth for riding breeches, 870 to 920 grams per meter (28 to 29.5 ozs. per yd.)

Uniform cloth, 680 to 730 grams per meter (21.8 to 23.4 ozs. per yd.)

Cap cloth, 550 to 600 grams per meter (17.6 to 19.2 ozs. per yd.)

The minimum breaking strength (pounds) and stretch of the goods to be as follows. Tests to be made on a sample 16 by 16 cm. (6.2 by 6.2 inches):

Breaking Strain	Warp	Filling
Mantle cloth	220	220
Trouserings	220	220
Cloth for riding breeches	220	220
Uniform cloth	200	200
Cap Cloth	154	132
Elasticity	**Warp**	**Filling**
Mantle cloth	30%	30%
Trouserings	30	30
Cloth for riding breeches	30	30
Uniform cloth	30	30
Cap cloth	30	30

Each bidder must state the quantity of each kind of material to be used and how much actual wool or yarn is in his possession. No attention will be paid to bids not accompanied by these particulars.

The Merchandise Marks Act

We give in this issue a report by the American Deputy Consul General at Paris on unfair competition in France, being the third report on this subject, the first one on the British Act appearing in our July, 1913, issue, the second which appeared in our August issue, dealing with the German law on the same subject. These reports are of interest in connection with the agitation to secure the enactment of a Merchandise Marks Act in the United States, showing that Great Britain is the only one of the three European nations which has enacted a special statute to prevent the misbranding of goods offered for sale. While the enactment of such a law in the United States is not yet in sight, a long step has been taken in that direction by the exposure of the absurdities of the so-called "pure textile" bills, which have been introduced by various members of the Senate and House of Representatives.

Commerce Reports

In order to bring the government publication, "Commerce Reports" to the attention of those for whose direct benefit it is published, E. E. Pratt, chief of the Bureau of Foreign and Domestic Commerce, Washington, has sent the following circular letter to over seventy thousand business concerns, and proposes to follow it up with others of similar import:

I should like to ask you the following question: Are you aware that the United States Government through this Bureau publishes a daily paper which transmits valuable trade information concerning market conditions in all parts of the world to American manufacturers and merchants?

As an American business man, you can not afford to overlook a publication which secures information from three hundred consular officials, located in every part of the world, which contains special articles prepared by commercial attaches and agents of the Department of Commerce, stationed at the most important centers of foreign trade, and which gives to the American manufacturer a daily list of firms in foreign countries anxious to buy American goods and represent American manufacturers. It also contains a complete daily record of what the United States Government wants to buy or construct.

Daily "Commerce Reports" is a Government publication which every American business man should read with his morning mail. It furnishes him with a daily summary of the market conditions and prices of different lines of industry in the world's markets, and contains notices of current changes in the tariffs and trade-mark laws of foreign countries. It shows you from day to day what your competitors in other countries are doing.

Daily "Commerce Reports" furnishes you with direct cable information from American consuls and attaches and, through its supplements, supplies you with complete annual reviews concerning the trade and industries of every country of the world. It also gives you every morning a list of foreign "Trade Opportunities" with which you can get in touch and which may mean specific and immediate business for you.

Daily "Commerce Reports" mean knowledge and additional trade for you.

Daily "Commerce Reports" will be delivered to your office by mail every morning for one year for the nominal sum of $2.50. If you are not already receiving these reports, I strongly advise your filling in the subscription blank below, and, after detaching it, mailing it, together wth money order or check to the Superintendent of Documents, Washington, D. C., or to the nearest branch office of the Bureau of Foreign and Domestic Commerce.

THE WOOL GOODS MARKET

Buyers for wholesale clothing manufacturers have been on the market during the entire month. Their activities in placing quantity orders for men's wear fabrics for the spring season of 1916 has imparted an old-time propensity to the market. They were alive to the true situation regarding prices and the comparatively limited supply of goods resulting from the unusual demands from foreign sources and the difficulty in getting colors up to the standard.

With demands for fabrics from many quarters of the world for civilian wear, and the new demand that has recently set in for army purposes, the available supply for domestic consumption has been materially reduced. Buyers apparently realized the situation and placed substantial orders with much less shopping and criticizing than has been their custom. In many cases they placed large orders on their first round of the market, apparently not having confidence in their ability to secure the goods a day or two later. It has been a sellers' market and it the prices obtained for fabrics are not profitable for the manufacturers it is the fault of the sellers.

Sales of both woolen and worsted fabrics for the month will rank among the largest month's sales for a number of years. This rush of trade has resulted in a number of mills being already sold up for the season and in some cases samples have been withdrawn from sale. There are mills with many more goods sold on orders than they can produce. These mills are relying upon cancellations to be made by the buyers. If orders are not cancelled in sufficient quantities the manufacturers will have to take the same privilege that buyers have exercised for a long time. It is a rule that must work both ways and it is liable to cause some friction among certain buyers who claim that it should apply solely in their favor. This is a time when manufacturers can and should hold buyers to a "strict accountability" for unmercantile practices. Some sales have been made with the agreement that, in case of a shortage of dyestuffs, the seller shall have the right to reduce the quantity sold. It is apparent that this privilege will be availed of in a number of instances.

Some of the mills that have withdrawn lines of goods are understood to have sold only the quantity that their supplies of dyestuffs will cover. When more can be obtained the goods will again be placed on sale.

The various lines of woolen and worsted suitings were opened during the month and practically all lines are being offered. About all lines are priced at substantial advances over those of a year ago. Sales have been freely made in quantity lots in most cases. Many prices have been advanced since the opening.

The demand has been large for both woolen and worsted fabrics with woolens probably in the lead. This has placed both classes of mills in good condition regarding the immediate future. There are always exceptions to the rule and some mills have not, up to the present time, met with the desired success. The season, however, is still young and there evidently will be enough business to keep mills well employed. Owing to the extremely small purchases of woolens and worsteds that have been made for a number of seasons by the clothing trade their stocks have been extremely small and that of the retailers equally so.

The advanced prices for new fabrics have caused an unusual demand for stock goods, which has cleaned the market comparatively bare. The consequence is that both the wholesale and retail trades have reached points where they are obliged to increase their purchases to stock up. This comes at a time when the mills are well employed in efforts to supply a good part of the world with woolen fabrics and when wool and dyestuffs are selling at greatly advanced prices. It is a situation that probably never before confronted the market for wool fabrics and

is should result in a profitable business generally for domestic mills.

A result of the advanced prices for all worsted fabrics has been the return to favor of fancy suiting fabrics made of cotton and worsted which were so popular some ten years ago. They have been ordered freely for low and medium priced suits for which the prices of all worsted fabrics are prohibitive. These fabrics, when properly dyed and manufactured, make very sightly garments which give good satisfaction, considering the prices at which they are sold. They are made in very creditable styles and colors and, to the uninitiated, appear like all worsted goods. It is more than probable that some unscrupulous retailers will sell them for all worsted.

The demand for tropical fabrics continued during the early part of the month with a demand for the better grade all-worsted fabrics. These fabrics will naturally make better fitting and better wearing garments than will the cotton warp fabrics, consequently they are in greater demand for the better class of trade. This is resulting in an additional business on tropical fabrics, as there is a decided prejudice on the part of the higher classed consumers against wearing cotton warp fabrics that will not give the best satisfaction.

The comparatively few mills making vigoureux mixtures report an excellent order business for the new season. Sales have been in liberal quantities and at prices from ten to fifteen cents per yard above those of a year ago.

Grays are taking a prominent part in the sales of spring goods. It is understood that they were designed to overcome the dyestuffs difficulty, which they do to some extent. They are popular colors for summer wear and have come into favor for the approaching season. The greater part of the goods sold are on low grade, and the better goods up to $1.25, in some cases up to $1.37 1/2. They are the fabrics in general use by the wholesale clothing trade.

The various lines of fine goods were opened during the latter half of the month and reports are to the effect that they generally are meeting with a satisfactory order business as far as the samples have been shown. These are the last men's wear goods to be placed on sale and it will take several weeks to cover the various markets. As they have practically no foreign competition they have every encouragement to sell to full capacity.

Already cancellations of orders for the new season are being made and in about every instance they are being welcomed.

There has been a revival of the demand for overcoatings, uniform cloth and blankets for the armies abroad and a number of new contracts were recently placed. These goods are required within a short time. With the large business being booked for spring goods, it is going to be difficult to get the goods made by the time required. Other contracts now being offered will not, in all probability, be placed unless the time for delivery can be extended.

A number of mills that have previously been largely employed on army goods have their usual lines of men's wear samples on the market with which they are having good success. They are not inclined to return to contract business unless prices and specifications should prove to be more tempting than were some of the last with which they had some experience a few months ago.

The scarcity of dyestuffs continues to be the greatest menace that manufacturers have to contend with, and it is creating an exceedingly serious situation with most mills. Supplies are gradually decreasing and while the output of domestic makes of dyestuffs is being increased, it is not in sufficient quantity materially to relieve the situation. Some mills have had to reduce their output until they can secure the necessary dyestuffs in the required quantities.

The dress goods business has not as yet become particularly active. The so-called corporation goods are being sold to a considerable extent with the principal sales being on piece-dyed fabrics, including cotton warp serges, which have secured considerable business. The finer makes of higher classed goods came on the market during the last few days of the month and still have their record of sales to make. One particularly noticeable event is the selling up, in two

days' time, of the largest combination of mills making the finer grades of poplins at prices ranging from $1.00 up to $1.15 per yard for broad goods.

THE RELATION BETWEEN PRODUCTION AND COST

Augusta, Me., Aug. 27, 1915.

Editor Textile World Record:

I have read with interest the paper published in your August number, and entitled "The Relation Between Production and Costs," by H. L. Gantt. It certainly contained food for thought.

Cost systems vary in detail as much as do the plants in which goods are made. Each plant has its own particular requirements necessary to determine correctly the cost of its mill labor, so-called, or the labor cost on the product.

The cost of material is, of course, easily determined and applied, but the proper distribution of the overhead or general expense of the plant, as a whole, is another matter, and certainly there are many methods for its application. Distribution by percentage of floor space in each department, actual labor paid for production, the value of machinery, percentage of mill cost, and machine hours are examples. Probably each method would work out admirably under proper conditions in different plants.

The contention which Mr. Gantt makes that excess overhead, above actual operating time is properly charged directly to profit and loss and not to goods produced is, however, debatable. Theoretically the idea is correct. No one denies that if a plant is shut down for six months, with no production, the overhead charges would be charged directly to profit and loss, or would eventually land there. There would be no other place for it.

I believe, however, that there is a point between this extreme and the reasonable loss of production where the theory would not properly apply. If we accept Mr. Gantt's idea as a hard and fast rule, it would seem to be a direct blow at any method of cost finding. Suppose the plant is running on an eighty per cent. production when it should be ninety-five per cent. Must that proportionate part of the overhead expense be charged to profit and loss and not directly to the goods? I think not. For an actual and practical cost, it should properly be assessed on the goods produced. Suppose one sets a standard of production, say of ninety-five per cent., with anything below that a proportionate contribution to the profit and loss account, would there not be a monotonous sameness to one's cost figures?

Of course, the overhead expense is only one item of the cost figures, but if the idea is practical on overhead charges, it would be true throughout the plant and apply to all indirect expense. Mr. Gantt makes the statement that if the plant is running on short time, the proportionate part which such short time bears to the regular working time should be taken from the overhead and charged to profit and loss. If, for example, the plant is running overtime, say ten hours a week, the same rule, no doubt, would apply, except that there would then be a credit in the profit and loss account. Under this system what a glorious burying ground that profit and loss account would be, and what a chance for an unscrupulous manager to put the blame where it did not belong!

It seems to me that the true cost of any kind of production is the total money that is required to produce the goods, divided by the total production. If one plant is unfortunate in having poor operators, the percentage of production is smaller than a plant having efficient help and the cost must then be higher. The object of a cost system is, not only to obtain a real final cost per pound, piece or yard, but to locate leaks.

If a department or plant is running below par on production, an accurately balanced cost system shows there is trouble, directly it comes to the cost man's eye. If the system is efficient enough, he can put his finger right on the sore spot, report it, and possibly have it remedied before the next report comes to him.

If the plant is on an eighty-five per cent. production basis and a competitor is producing ninety-five per cent. on the same class of goods, he is producing his goods at

a lower cost whether the first plant charges the excess to profit and loss or to the goods direct. The only thing to do in this case is to go out and get ninety-seven per cent. production and let the poor old profit and loss account alone. That account will look after itself without any interference if a manufacturer gets his plant moving on an efficient basis. Charles R. Chase.

THE FACTS REGARDING THE DYESTUFF SITUATION

A Statement by the Master Dyers' Association of Philadelphia

Philadelphia, Aug. 29, 1915.

Owing to the many misleading and erroneous statements that have been published, in many instances originating with persons unfamiliar with the manufacture, sale and use of dyestuff, we feel it is the duty of those engaged in the dyeing industry, and who are entirely dependent upon a supply of dyestuff to continue their business, to inform the public of the conditions as they actually exist in Philadelphia, the largest dyeing centre in the world.

We have gone to great expense and inconvenience to follow up every prospect that would seem to promise relief, have held many special meetings, and have been represented at every public demonstration which endeavored to develop something that would at least answer the purpose until normal conditions would again prevail, and it is only fair to say that no new methods have been developed for the manufacture of dyestuffs, and our tests of so-called new fast blacks have convinced us that in no instance can they be compared with what every dyer and textile manufacturer is thoroughly familiar with as fast black.

The American manufacturers of dyestuff who were established prior to the war are well aware of what is required, because of their experience with foreign competition, and they are making every effort to meet the situation, but they find the greatest difficulty in securing raw materials in sufficient quantities, owing to the present demand for those raw products for other purposes. We understand that their efforts are mainly directed toward producing shades of black, which of course are used in largest quantities, and while this will be a very great help, it is only a question of at most a few weeks when the shortage in colors of various shades will be as bad as that which now exists in blacks.

It is quite true that some dyestuffs of all colors are still being offered for sale, but with hardly any exceptions these are in the hands of dealers, without any manufacturing connections, and in some instances they have never before this year been even indirectly connected with the manufacture or sale of dyestuff. These materials are quoted at such prices as to entirely prohibit their use. As an illustration, a product well known to all users of dyestuff, Black BH, which formerly sold for 23 cents per pound, is now offered at $7.80 per pound. This is not an exception but the general rule, with only a slight variation in percentage of increase favoring Black BH.

One of the best known dyestuffs in the world, Sluphur Black, formerly sold at about 20 cents per pound. Some sales are now being made at $3.00 per pound, and the tinctorial power has been reduced from 33 1/3 to 50 per cent., as compared with former standards. This has made it necessary to advance the price of dyeing 500 per cent. and even more, making the material unmerchantable when colors possessing the qualities of coal tar dyes are required. We are therefore forced to use what are commonly called vegetable or wood dyes. These we cannot guarantee because they are not fast, and they have been obsolete in wearing materials for the textile trade for many years.

These facts are conservatively stated, and are given at the repeated requests of many manufacturers and distributors of textile fabrics, who find it difficult to convince their customers of the actual situation, and this lack of appreciation is entirely due to the publishing of statements by persons who are not familiar with the actual facts.

Respectfully,

The Masters Dyers' Association of Philadelphia. D. F. Waters, President; Germantown Dye Works.

Wm. H. Brehm, Vice-President; Allegheny Dye Works.
Wm. J. Wall, Secretary; Nicetown Dye Works.

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THE CAMERON PRINCIPLE OF CUTTING FABRICS

In the development of the textile industry the cutting of wide fabrics into narrow strips has been made necessary in order to supply a variety of wants. In this way the cutting process which would ordinarily be considered of trifling importance, has grown into

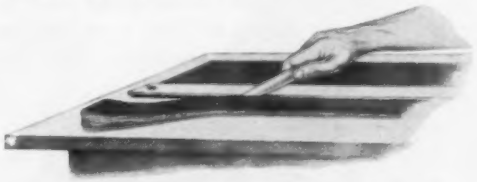

FIG. 1. STRIP CUTTING WITH STRAIGHT EDGE AND HAND KNIFE

an operation involving considerable expense to a number of industries allied to textile manufacturing.

Before calling attention to what is the latest development in appliances for cutting fabrics it will be of interest to give a description of the various methods by which this work has been done. One operation of limited application consists in strip cutting by

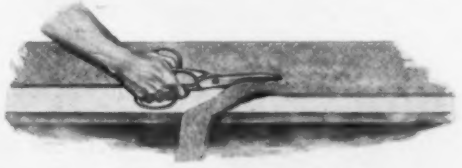

FIG. 2. AN ELECTRICAL SHEARS

hand with the aid of a straight edge and knife, as shown at Fig. 1.

Another simple operation of cutting cloth into strips is often employed in the clothing industry and consists in the use of an electrical cutter or shears, the last named appliance being shown at Fig. 2.

A third method consists in putting a full piece of cloth under a guillotine press and cutting the goods into strips, as shown at Fig. 3. These methods are, of course, unsuited for doing the work on the large scale required in modern industries, being both wasteful and inaccurate. The need of a more economical process has led to the development of cloth cutting machinery, of which there are a number of types, each marking a step in the development of the process. They may be divided into two classes, the first, shown at Fig. 4, consists in the use of a stationary blade against which the cloth is drawn, thus cutting it into strips. This process is objectionable because the edges of the cloth are very liable to ravel. Moreover, the blades quickly become dull by contact with the goods and then the cutting

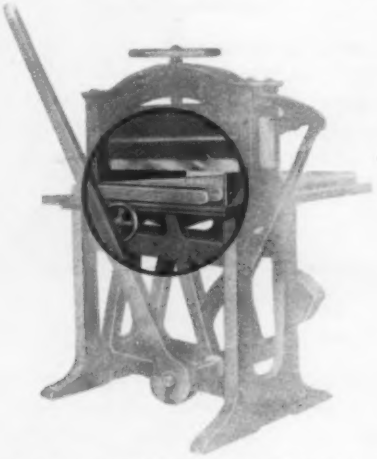

FIG 3. A GUILLOTINE PRESS AND CUTTER

process is converted into a tearing operation.

Another method, shown at Fig. 5, consists in the use of discs made of thin steel revolving at high speed and adjusted so as to cut the strips to the desired width. The cloth is cut as it is drawn under the discs. While this is an improvement over the previous method, it is open to the same objection, that the cutting edges soon become dull. Furthermore, there is the danger of injury to the operator.

Another method consists in the use of a revolving shear. Two cutting discs overlap each other slightly so that the cloth is cut by a shearing process as with a pair of scissors. While this is another step in advance of the methods already described, it is open to the same objection, that the cutting edges soon

become dull and then the cloth is torn instead of cut. Moreover, it is necessary to keep all of the discs exactly of one size, otherwise some will cut faster than others, causing the cloth to wrinkle and make bad work.

The disadvantages inherent in these various methods of cutting cloth into strips has led the Cameron Machine Co., 57 Poplar St., Brooklyn, N. Y., to develop what has become generally known as the Cameron principle of cutting cloth. They employ in their

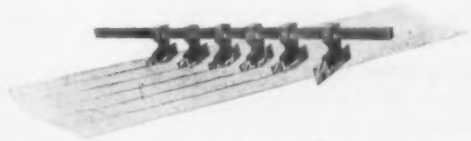

FIG. 4. SPLITTING CLOTH WITH THIN BLADES IN SPACEABLE HOLDERS

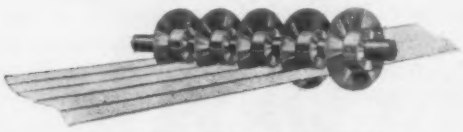

FIG. 5. REVOLVING DISCS OF THIN STEEL

slitting and rewinding machines a combination of new principles. Instead of cutting the goods with a keen edge of any kind, they press metal discs having an edge much like an ordinary cold chisel, but circular in shape, through the fabric at the point

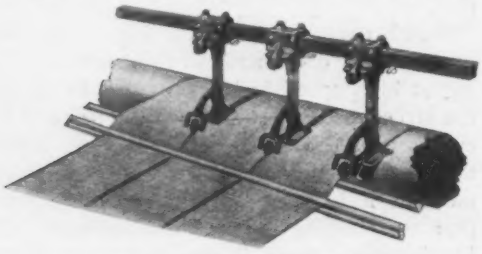

FIG. 7. THE PENDULUM CUTTER

where the goods are to be severed, as shown at Fig. 6. The "cutting wheel" has a V-shaped edge and is mounted on a ball bearing so that it can be revolved freely. It is pressed by a spring against a polished steel roller. In this way the cloth is divided by a clean cut. The edge of the strip is clean and smooth and free from fraying, as the operation tends to press the edge of the fabric so as to prevent the raveling of the warp. This method has many novel features and is patented here and abroad.

In developing the Cameron machine it was found that manufacturers of broad silks, huck towels and other fabrics have for years faced the problem of separating wide webs made with doups or selvages into narrow strips. This work was done by hand, the results being very unsatisfactory. In order to meet the special requirements of the process, the Cameron Machine Co. designed the Pendulum cutter, shown at Fig. 7, which has given very satisfactory results. The long

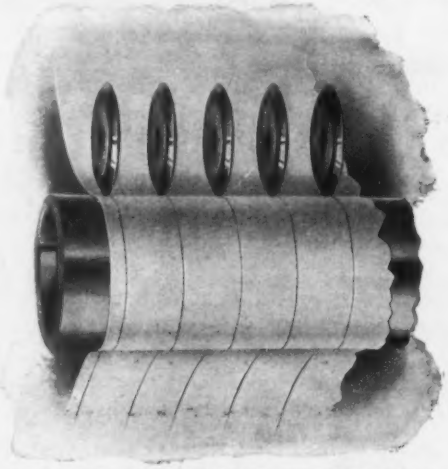

FIG. 6. THE CAMERON "SCORE CUTTER" PRINCIPLE

experience of the Cameron Machine Co. in connection with the work of cutting wide goods into strips has enabled them not only to design the most improved methods for performing the work usually required in this line, but to supply the best appliances for meeting special requirements.

The Cameron Machine Co. will be pleased to give any manufacturer engaged in cutting wide goods into strips the benefit of their long experience in this special industry.

As far as history goes, there is every probability that India was the original home of the cotton plant, in the Eastern Hemisphere at least, for there are positive records of cotton in India as far back as 800 B. C.

The National Association of Cotton Manufacturers

The autumn convention of the National Association of Cotton Manufacturers was the ninety-ninth meeting of the organization and one of the best attended in its recent history, over 300 members and guests being present during the convention days, September 9th, 10th and 11th, at the Hotel Griswold, near New London. This meeting place has proved one of the most satisfactory for the autumn conventions. The place is accessible, the hotel is large and first class in all its appointments and amply fitted to handle the big convention without friction. The cooperation of the management assisted in a marked degree toward the enjoyment of the occasion.

ALBERT GREENE DUNCAN, PRESIDENT OF THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS

The hotel is beautifully situated on the river about a quarter of a mile from the Sound and even on the very hot days, cool spots could be found, while those who cared

to go either on or in the water had the opportunity to do so. The golf links, which have been greatly improved, were near by and a large recreation field afforded opportunity for the baseball game. Several good tennis courts were in close proximity to the hotel so the guests could watch the matches being played. The weather was all that could be desired except for the heat. The autumn meeting is generally understood to be more of a social gathering than a strictly business convention and the program was arranged to give ample scope for outdoor enjoyment and much interest was taken in the various sports.

The first session on Thursday evening was devoted to the reading of the President's address, which was as follows:

PRESIDENT'S ADDRESS

Albert Greene Duncan, President, Treasurer Harmony Mills.

Members of the National Association of Cotton Manufacturers and invited guests:

There is one topic that I believe is in all your minds. With the possibility of international complications, with wars and rumors of wars filling the columns of our press and the whole universe surcharged with an intensity of feeling never known to this generation, Americans are unitedly and each for himself considering the question of National Preparedness. We have for many years relied upon our splendid isolation, and neither in military preparation nor in the full development of our resources have we ever built up that independence, as a nation, that has been in relations between man and man, the keynote of our government from its inception.

As the expanse of oceans which separate our shores from possible foes have made us indifferent to admittedly inadequate provisions for defence, our separation from the severe commercial rivalries of Europe have closed our eyes to the necessity of commercial independence. Serene in our determination not to be a party to any European struggle, we never imagined we could be the victims of a quarrel not of our own making, nor that any possible embroilment of other nations could be so far reaching that we should suffer from its effects in our world trade relations and even in our domestic affairs.

Military preparedness and industrial preparedness should go hand in hand. The sinews of war must be provided by the latter before the former can be developed to its full extent; and by commercial preparedness, I mean not only the strengthening of those industries which would necessarily contribute supplies for a possible war, but all enterprises of manufacture, transportation and distribution, so that we can put behind any body of men enlisted in the nation's defence "a united, prosperous, contented and determined population" and be able to supply all the varied wants of our people and furnish the fullest support to the Government in any time of trial.

We have learned the sad lesson that trade relations with other countries, however firmly rooted, are secondary to military exigencies. We have seen our mills handicapped and in some cases forced to close or curtail, due to shortness of wool, dyestuffs, chemicals and other needed supplies, many of which our country would have been amply able to supply if the idea of commercial and industrial preparedness for any emergency had been kept in mind.

Our financial dependence on other nations was brought home to us very strongly in the early days of the war, and though righted temporarily by a demand for products we alone can supply, we should not overlook the fact that the present difficulty of the settlement of foreign balances in our favor, may seriously curtail our prospective exports.

Our National honor, and even our existence, may depend upon the extent and the thoroughness in the next few months of our military preparedness, but as a basis and ground-work which alone can make possible the enormous expenditures involved, our domestic affairs should have equal attention. In the midst of international complications, when we know not what a day may bring forth, it is the duty of every true American to stand by the President in his effort to preserve our National dignity and honor. On the other hand, may we not urge it as an equal duty upon the President, to stand by us in an effort to bring back and maintain the business prosperity of the country.

In the crisis that confronts us, all consideration of party advantage or sectional benefit must yield to the paramount necessity of placing this nation in a position of national industrial preparedness, ready to cope with any emergency that may arise, and the party which makes this its ideal will be the one to enlist the support of the American people.

As a basis and starting point for the most complete national industrial preparedness, the public and legislative hostility to business which has been growing ever stronger during the last decade, must be allayed. This hostility has reached its climax in the legislation of the past few years, and we may well ask ourselves whether the result has aided or retarded our National development, or put us in a better position to face the new conditions which a world war has brought upon us.

The manifestations of hostility to business are known to all. Prosecutions under the Sherman Anti-Trust Law by the National government, restrictive legislation by the states and innumerable investigations by commissions, have marked the trend of public sentiment. Even though in a large majority of cases where business has been indicted, evidence of wrong-doing has been lacking, the suspicion and distrust of the public has continued. In some communities the name corporation, which simply describes a method of business organization, has become a term of reproach.

The statement has been often made and should be reiterated that the whole course of anti-business legislation from the Sherman Anti-Trust Law to the present day has not been made necessary primarily by the wrongful acts of business men.

Instances innumerable can doubtless be cited of dishonesty, trickery and oppression on the part of individuals and corporations, but there is no more justice in calling modern business dishonest and harmful than there would be in denouncing a whole community as corrupt and vicious because some of its citizens occasionally need the restraining hand of the police.

The demand for regulation of business is not wrong or unreasonable, and if based on sound economic facts and a sympathetic rather than a hostile attitude would have brought good rather than harm to the interests involved. The great development in the last quarter century of industry, of transportation and innumerable lines of activity pursued by modern business, calls for controlling laws, not needed in that earlier day when every man's activity was under the direct cognizance of his neighbors.

The basis of legislation and regulation, however, should be the great principles involved in the necessity of modern business to meet the needs of the conditions of modern life. Regulation should not involve denunciation of individuals or of sporadic practices, but should go to the root of our whole business structure, with the full realization that individuals have been but factors in a movement that was inevitable in the growth of our country.

C. J. H. WOODBURY, SECRETARY OF THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS

How different a generation ago was the attitude of the public and their legislative bodies towards business. Men who in recent years have been regarded almost as criminals were then lauded and exalted as great captains of industry.

Before the Civil War we were distinctively an agricultural people, and not until that struggle had settled many questions of state rights did our country enter upon a national life which demanded highly developed industries. The needs of a rapidly increasing population called forth the full energies of our people to provide our new citizens, not alone with food and employment, but with all the necessities and comforts of life.

Our government took the lead in the encouragement of industry, meeting a hearty response by all classes of the people. The whole policy of the states and the nation was, in the decades of 1870 to 1890, to stimulate in every way the industrial and transportation expansion of our country. Previously, industry had been localized, but with the growth of a strong national feeling, it was inevitable that business should be also nationalized

CHAS. H. FISH, NEWLY ELECTED TREASURER OF THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS

and given every aid that an intelligent and progressive government could render.

You all recall the subsidies and enormous grants of land to our transcontinental railroads, the numberless instances in which municipalities and even the states bonded themselves or pledged their credit for the development of railroad systems, with the object of opening national means of communication between different sections of our vast country. Municipalities following the same policy granted to manufacturing establishments freedom from taxation and other privileges, extending often over long terms of years.

This laudable object of developing America as a land of industry fully justified in the public mind these various aids and exemptions.

As a natural accompaniment of this industrial expansion, corporations became and are today a necessary factor in our national life. There seems, however, to be in the public mind a great misconception of what a corporation really is. A corporation is an aggregation of individuals formed to accomplish a work that would be impossible for any one of the associates acting alone. Chartered by a state, they at first engaged in enterprise within the Commonwealths that founded them, and were subject to careful supervision by the community within whose limits they operated. Public sentiment, however,—carried away, it would seem, by the wonderful strides that our industries were making,—favored in certain states the granting of greater powers to corporations whose activities could not be confined within the borders of the state chartering them, but which conducted operations of a wider scope. Some states, eager for the revenue which corporation taxes could provide, exercised no supervision over the creatures of their creation, nor did they require that degree of publicity as to their financal standing or their acts to which the public is fairly entitled. Many business men called attention to the evil which would result if such indiscriminate incorporation was allowed, but the public gave little heed to these warnings, and permitted the granting of unlimited powers to companies to issue securities in any amount and often based on insufficient property values. Is it any wonder that corporation managers with such powers placed in their hands sometimes overstepped the bounds which marked fair dealing to the public and their competitors. The public should realize that to their own over zeal and short sightedness is due in a large measure the excesses of which they now complain.

A corporation, though impersonal, has no power not conferred upon it directly by the public in accordance with the laws of whose legislature it was chartered, and no right of existence independent of the will of stockholders whose money it uses.

Without the development of corporations, it is safe to say that the wonderful growth and expansion of our country during the last twenty-five years would have been impossible. Without corporations business would have been confined to local activities for it was only by the gathering together of the savings of an army of investors, that requisite capital could be secured and energized by the great minds who conceived and carried out the plans of national development under corporate form of management.

Figures have been given many times showing that corporations are really owned by the public, that the average holding of the individual stockholder is of small amount, that the number of individuals represented in some of our greatest corporations reaches stupendous proportions, in some companies comparing with the number of employes.

Mere size of a corporation is no indication of wrong, either in its foundation or its operation. The day of the local railroad ceased when the public demanded through freight and passenger lines to give speedy and reliable service from one end to the other of our vast area. With the advance of ocean transportation and the instant interchange of information by cable between all parts of the civilized world, our business men were forced by the necessity of existence to combine their resources into great corporations if they were to survive in the commercial struggle with

gigantic foreign companies often under government encouragement or patronage.

Some form of regulation is undoubtedly necessary, due to the present national character of our business. This should take the form of the frankest publicity, and the laws of the Commonwealth of Massachusetts under which cotton mills have operated with fairness to their stockholders and the public, may well be taken a a model. Such regulation should provide for adequate annual statements to insure to the stockholder the safeguarding of his investment, and be the basis of credit which the corporation asks from the public. Regulation, further than this, should be undertaken only after most careful study, and should be based upon the soundest economic principles, recognizing that aggregations of capital in corporate form are necessary if business of national scope is to be carried on.

Intead of the cry of recent years to divorce business and politics, it would seem desirable that business and politics be brought closer together, and that the advice of men trained in the economics of business be sought when legislation or regulation is under consideration affecting not alone their interests but through them the interests of the public whose property they are managing. They should not be called lobbyists and pilloried before their fellow citizens as doing an unworthy act when advising with their representatives in Congress in an effort to enlarge or protect the industries they represent.

The hearty confidence of the public in the essential integrity of business is the basis of all true prosperity, and the people at large should recognize that the corporation is a natural and logical development, and that any legislation which tends to destroy the intricate structure of business is a backward step.

Regulation as to the legality of business practices should be based wholly on the public interest. Search the existing statutes of the United States in reference to business, and where do you find this idea? You see monopolies and combinations declared illegal in themselves, without any reference to whether the public is harmed or helped, and the slow process of judicial interpretation covering a period of more than twenty years has been required for the Supreme Court to finally determine that the "rule of reason" must be used in enforcing legislative acts against these prohibited monopolies and combinations. Business is still in doubt, however, as to what acts future courts will decide this covers, and although four years ago the Supreme Court rendered its decision, cases in the District Courts have since been prosecuted without any regard to the rule thus laid down.

Legislation that should clearly state that the interest of the public is the sole determining factor as to the legality of an action, would, once and for all, settle this vexed question. It is not in the public interest the corporations, by excessive competition or ruinous restrictive legislation, be put in a position where they cannot obtain capital for their necessary development, pay to their stockholders a fair return upon their money, or compensate their employes adequately for their labor. The public will suffer in the long run if excessive competition or restrictive legislation is carried to the point where the prosperity of the business community is not given ample consideration.

Great Britain has developed the common law so that this test of the public interest is the starting point of their business legislation, and the anti-trust laws passed by the two great colonies of Canada and Australia are based upon this theory. In Australia combinations whose effect has even been the raising of prices by agreement have been declared fully legal and in the interest of the public, when it was shown that such increases were necessary for the prosperity of the business involved.

Australian courts have held that the public has no right to demand that they be served by corporations who are forced to do business at a loss, that the broader interests of the public and the employes of these corporations are better served by a fair price being paid than by prices being forced below the real cost of production by excessive and ruinous competition.

A belief in the essential unity of business prosperity and the public interest must prevail if this country is to reach that state of complete national preparedness which the present world crisis forces upon us. Unfortunately the expression of legislative opinion and the decisions of our most important national commission fail to take this broader view that true national prosperity is inseparably dependent upon the individual prosperity of producer, consumer, stockholder and employe.

Instead we find legislative action and commission rulings tending to sacrifice one portion of our citizens in the so-called public interest. Is it not time to call a halt to this narrow view and unite in a campaign that will enlist the support of every American, standing behind the President not only in the upholding of our National honor but with his lead in the enhancement of our national prosperity.

The result of many years of agitation has culminated in the legislation of the last two years with the creation of a Federal Trade Commission with undefined powers and the forming of a Committee on Industrial Relations, which after expending half a million dollars, ends its futile existence with as many separate reports as it has members. Most typical, however, is the change in the economic policy of providing for national revenue, by the enactment of a tariff bill passed as a verdict against a protection for profit (this necessary adjunct of our business existence to be left to the sharpening process that the wits of our business men would undergo in a world-wide competition). Prediction was made that this law would not disturb business, would decrease the cost of living, would increase our foreign trade and would provide ample revenue for the government.

None of these predictions have been realized. The cost of living has not been reduced. Our export trade, with the exception of war orders and war food supplies, has not increased. Business has been disturbed so that only the outbreak of war and the conequent restrictions of imports saved us from disaster. The ample revenue promised has not been in evidence in spite of the extra taxation imposed under the guise of a war revenue

tax to bolster up an ever increasing national deficit.

Under normal conditions with a world at peace, it would be too much to ask that a National Administration reverse itself, but in the situation that at present confronts this country, knowing the futility of the Underwood Tariff law to raise revenue, appreciating the serious condition of the United States treasury and foreseeing the enormous expenditures that will be necessary if National preparedness is to be but a paper plan, ought not the business interests of the country, irrespective of party, to demand that the administration meet this situation in the only way possible and give the country a tariff ample for revenue and sufficient to protect our industries from the ruin threatened by the inevitable influx of enormous quantities of cheap goods made by the starving populations of Europe after the war.

Our industries should not be dependent for their existence on the continuance of the slaughter abroad. The dawn of peace should not mark the ruin of many of our manufacturers.

When your President addressed you at the last meeting, he made statements as to the halting attitude of business which were challenged by a member of the Cabinet, whose chief aim during the last year has been to show that business was as properous as ever and was not affected by the disastrous tariff legislation enacted by the present administration. Official figures are now available, published by the Secretary's own department, which prove the statements referred to to have been conservative and amply borne out by the record of imports before and after the tariff law was in operation.

If we reviewed the present status of our country under normal conditions, we should have cause for optimism, yet existing conditions give us cause for dismay. We have been blessed during the year, and have assurance for the future, of bountiful crops at high prices. There has been a call from belligerent nations for our foodstuffs and other materials, hitherto unprecedented in our history. This with the decrease of our imports owing to the inability of the warring nations to supply other than their own most imperative needs, has caused a wonderful trade balance in our favor. We have become for the first time a creditor rather than a debtor nation, which gives us an abundant, and in fact an over-supply of money; yet there is no general relief from the business depression. With the exception of certain industries, whose activities may be summed up under the general head of "war order," general business has not materially improved over the stagnation of last year. We find consumers purchasing scantily; a policy adversely affecting retail trade and reacting sharply on manufacturers and transportation lines. This sluggish tendency of trade is apparent to anyone studying the reports of railroad traffic, of bank clearings, of idle freight cars and other barometers of our business activity. These show that, compared with prosperous times, business is still in a depressed condition, and, that it is heitating owing to our utter lack of national industrial preparedness.

I have tried to outline the situation that will confront the next Congress whether meeting in December or called in extra session. I have tried to show the false basis that underlies much of our recent legislation. I have tried to call American citizens to a higher place of thought than mere partisan politics, to the ideal of national legislation for national needs. The next year is pregnant with opportunity for the business man, in that the policy of the country, both foreign and domestic, for the next four years will be decided, years the most critical in the industrial life of our nation.

These facts should bring sharply to our minds the necessity of business legislation by business men, who should bring business and politics into harmony and as a unit determine the policies which shall shape the destinies of our beloved country to the highest and noblest ends.

After adjournment there was a very enjoyable cabaret entertainment in the grill. Stephen C. Lowe was conductor and was ably assisted by volunteer talent.

At the opening of the Friday morning session President Duncan made the interesting announcement that hereafter instead of the offices of secretary and treasurer being held by one incumbent, the Board of Governors had chosen as treasurer of the Association, Charles H. Fish, a well known and active member of many years standing, who has in the past received medals for papers presented and always taken an active interest in its affairs. The increase in the scope of the activities of the Association, which frequently demand the presence of its secretary and other officers in other cities on governmental and business consultation, has led to the necessity of the work being divided and the Association deems itself fortunate in securing Mr. Fish's cooperation. He retains his own private practice, as consulting engineer, although giving the necessary time to the work of the Association. This step is in line with Secretary Woodbury's suggestion made several years ago. He will be relieved of some of the work which he has heretofore done and be more free to devote his time to the technical work of the association. The new arrangement is one that meets the approval of all interested and will result in increased efficiency and extension of the work.

The morning session was given up to the discussion of recent investigations for determining the length of cotton staple and illustrations of their application, presented by

Dr. N. A. Cobb, of the United States Department of Agriculture. This is a continuance of the work conducted by Dr. Cobb and covered not only experiments made in connection with the Department work, but some personal investigations of his own. Dr. Cobb's paper is profusely illustrated by diagrams, tables and illustrations which we are not able to present at this time, but which may be had in their entirety in printed form on application to him or to the secretary of the Association.

The principal points brought out relate to his experiments in determining the length of staple and certain characteristics in regard to the natural twist in the cotton fibers and the effect of moisture on the fibers. Dr. Cobb also explained his system and apparatus for determining exactly the length of fiber, which he advocated as a great improvement over the usual methods of estimating the length of staple by the cotton pull. He submitted interesting statistics showing the variation in experts' estimate of the length of staple compared with the actual length determined by exact measurement. There was a free discussion by manufacturers who asked many questions that brought out many interesting points. Mr. Newburger of Memphis called special attention to the growing practice of selling on type rather than length of staple, believing that character in the staple is the important thing, providing the length is satisfactory. He thought perhaps too great emphasis was laid on length, particularly when facts seemed to show that length was more or less a matter of expert opinion which varied so greatly. If a manufacturer is buying a certain type that satisfied his requirements it seemed to make little difference whether he called it 1 1/8 inch or 1 1/4 inch.

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METHODS OF DETERMINING LENGTH OF COTTON STAPLE AND ILLUSTRATIONS OF THEIR APPLICATION

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This paper on the accurate measurement of cotton staple and some of its applications, is, therefore, an account of observations and experiments by no means all recent, even some of the more fundamental. They date from experiences wide apart, extending over a long period, including an occasional series of years of close contact with manufacturing problems, and occasional periods of study of the elements of the wool and cotton industries, both abroad and in this country.

It is perhaps needless to remark that while what I have to say relates particularly to length of staple, it is by no means implied that this quality is anything more than one of the several qualities determining the value of cotton. It is, however, important to disassociate these various qualities, in order that they may be tested and appreciated separately. Thus only can we obtain the clearest idea concerning the combined effects of these qualities as they appear in the industry. Such a dissociation of the elements of a problem is simply the application of one of the most elementary of all scientific principles—that of considering each variable independently, if possible.

This fiber has been classed more or less roughly on something like the present basis for over a hundred years, and grades very closely resembling the present grades have been in active use for over half a century.

I think very few good judges would dare predict that even for a long time to come the bulk of the cotton grown in the United States will be other than hand-picked and saw-ginned. As for uncertainties due to change of varieties grown, a system that has survived the extension of cotton-growing from the Eastern States to Texas and Oklahoma, with all that this extension has meant in the matter of new varieties and changed conditions of soil and climate, is hardly likely to be seriously altered by any forces that can at present be seen at work.

It is difficult to believe that the two elements, color and foreign matter, the elements that enter into the determination of grade, can on any reasonable basis be held to be in any practical sense liable to change in the near future. Any such supposition would appear to be rather far-fetched. but it may be predicted with good show of reason that the use of better methods of ginning and cleaning will improve the staple and general condition of cotton. Such improvements will result mainly in throwing more cotton into the higher qualities, where the variable factors, color and foreign matter, are at their minimum values, and, therefore, precisely where the present system has its maximum strength. These changes will not do away with such factors as color and foreign matter, which so long as cotton is grown in the open bid fair to remain much as they are at present.

Our problems appear, therefore, to be mainly those of perfecting present methods, and I propose today to bring to your attention certain methods, ideas and facts relating to length and strength of staple. I shall attempt to limit myself rather closely to setting forth the results of my own researches along the lines indicated. I think you will have no difficulty in apprehending the application of these results to your own personal problems, should they have any such application. It may be well to add that I am speaking as an investigator rather than as a government official, and am presenting conclusions for which, if necessary, I may be considered alone responsible.

Let us first examine the prevailing method of

determining length of staple, with a view of disclosing the possibility of improvement. That there is room for improvement is, I think, fully demonstrated by the table of estimates of length, obtained through cooperation with some of the best experts in this country, to whom thanks are specially due for the time and care they have devoted to assisting in this matter. The uniformly striking feature in these tables is the wide variation in length-estimates made on the same cotton.

A study of this table brings out three cardinal facts: 1.—Experts nearly always over-estimate the length by from 1/32 to 1/4 of an inch, the amount depending in a general way on the length of the staple,—the longer the staple the stronger the tendency to over-estimate. 2.—The same expert in two cases gave his estimate of two or more samples, and his estimates occur in widely different portions of the table, affording definite evidence of the personal error to which experts are liable under the ordinary method of making a pull. 3.—The mean length of the expert's pull bears a very variable ratio to the mean length of the cotton from which the pull was made; some experts remove a relatively large amount of the short fiber, others do not.

CAUSES OF ERRORS AND DISCREPANCIES

One may well ask, "What are the causes of these large personal errors?" The causes may be listed here in a preliminary way somewhat as follows:

1. The expert throws away, in the course of his manipulations, an indefinite amount of short fiber, which will vary with different samples of cotton, and of course with different experts. As pointed out elsewhere, these variable factors are practically incapable of accurate description or definition, and any attempt to accurately systematize them would appear to be practically hopeless.

2. In the final stages of the pull it is usual to discard some of the longer fibers of the pull, in order to "square it up." The amount thus discarded is variable, the variations being at least partly a function of the character of the cotton being examined.

3. In the case of weak cottons, the manipulation is freqently sufficiently harsh to break some of the fibers. This results in a shorter pull than would occur if no fibers were broken.

4. If pulls are made under varying conditions, as for instance, on different days, with different atmospheric conditions, the varying conditions of the cotton will give a variable fly-back. A description of fly-back and its relations to cotton pulling is found on page —. According as the fly-back is large or small—and this varies with the state of the atmosphere—the final pull will appear shorter or longer.

It will be seen that the inaccuracies and uncertainties in making a pull of cotton in the ordinary way are connected almost exclusively, or at any rate largely, with the casting out and the breakage of fibers. This fact leads naturally to the inquiry whether it is not possible to make a pull in such a way as to obviate these difficulties. Such a way I have proposed in connection with my approximately accurate method of measuring cotton staple, a method whose development was made possible by the invention of the fiber projection method.

To obviate the difficulties connected with the casting out and breakage of fibers, it is proposed in this approximately accurate method to make a pull without casting out fibers, and without breaking fibers. To make a pull in this way is entirely feasible. It involves selecting in the first instance the right amount of fiber to compose the pull, and incorporating in the pull all the fiber so selected, the operations being carried out so gently as to avoid breakage. There are then left only the inaccuracies due to fly-back, and it is proposed to reduce these as much as possible by conditioning the cotton so as to always bring it to approximately the same state as regards moisture content.

This conditioning may be accomplished in any one of several different ways. Cotton merchants and others have sometimes maintained in connection with their offices, special rooms or cabinets devoted to the conditioning of cotton samples. There is, I think, a growing feeling in this country that this matter is more important than has hitherto been supposed. In foreign countries much greater attention is paid to this subject, and the artificial humidification of the atmosphere of mills and conditioning laboratories, when necessary, is accomplished in a practical way, and on a comparatively large scale. Experimental results have convinced me that all future technological experimental work connected with cotton, whether it be for the judgment of the fiber before it is spun, while it is being spun, or after it is spun, will disregard the moisture question at its peril. There is no agency entering into experiments of this kind, whose object is to judge of the quality of cotton, that can afford to pay anything less than very careful attention to this matter. Cotton is not only one of the most hygroscopic of fibers, but it is one which takes up and loses its moisture with remarkable uqickness. Only a few minutes, sometimes even only a few seconds, are required for any marked change in the moisture content of the surrounding air to cause a very distinct difference in the qualities of cotton fibers exposed to it. It is for this reason that a year or two ago humidification was introduced into the quarters allotted to the preparation of the official cotton grades, an idea which is being expanded and will, I venture to predict, result sooner or later in the introduction of humidification apparatus in most premises where important judgments are being passed on the quality of cotton. In fact, in the light of past experiments, it is rather difficult to understand why we have been so slow in comprehending the importance of this matter. This allusion applies to very little of the experimental work carried out under experienced scientific direction, but applies with much greater force to the conditions which up to now have existed in our mills, cotton exchanges, and important mercantile companies.

In order to illustrate the importance of this matter from data which I have personally secured in the course of my investigations, the following instances are cited.

A small "plate" of cotton, reduced to a bone dry condition, was breathed through for five seconds. It increased in weight.. 3.94%
It was breathed through for an additional five seconds and gained 3.00
It was breathed through for an additional five seconds and gained 2.00
It was breathed through for an additional five seconds and gained ..... .84

It will be seen that the gain in weight was exceedingly rapid and entirely in consonance with the rapid and relatively violent contortions exhibited by cotton fibers when changed from dry air to moist, and vice versa.

It is also important to note that having gained about 8 per cent. in weight, cotton no longer takes up moisture at this rapid rate. Other experiments show that in a moisture saturated atmosphere cotton will go on absorbing water until it has gained over 25 per cent. in weight, but this additional gain in weight requires several days for its completion.

NEED FOR MORE CAREFUL STUDY OF THE SINGLE FIBER

Experiments and observations lead to the belief that there is need of much more careful study of the individual fiber, a study beginning in the field and including all varieties of cotton and all stages of growth, and extending through the ginning, baling and storage houses, ending only after it has been followed through the mill into yarn and fabric.

A careful scientific study of the industrial uses of a fiber like cotton soon leads one to ask himself, "What are the elements in these problems?"

Failure to give full consideration to fundamental elements has been a weakness in various investigations of cotton lint. No doubt this has been due partly to absence of convenient apparatus by means of which the elements could be adequately investigated.

The majority of these elements, when isolated and clearly set forth, are found to be relatively simple. All, or most of them, are contained in or cluster round the single fiber. This fiber, however, is so narrow that its structure can be made out only with the aid of a microscope.

That most of the physical principles entering into our cotton problems are illustrated in or on a single fiber of cotton becomes clear when we consider such facts as that, broadly speaking, the color and luster of a mass of cotton is a function of the color and luster of its individual fibers; and that the strength of the yarn depends upon the strength and length of its component individual fibers, as well as upon the way in which these fibers bind together and produce friction one on another. It is the same to a great extent with other features furnishing a basis for profitable study; they are definite properties present in each fiber.

In considering cotton each branch of the industry has its own viewpoint; but none focuses attention on the single fiber. The talk is of acres of cotton and bales of cotton. The manufacturer ought to get closer to the single fiber than others, and so he does, but not close enough. His inclination is to confine his attention too exclusively to the bales that come into his mill and the yards of cloth that go out of it. He too seldom reaches the elements of his prblem as represented in the single fiber.

What is the relative strength of the fiber in different parts of its length? When it breaks in the gin or in the mill, where is it most likely to break? Is the slender terminal portion as much weaker as it looks to be? Is the apparently massive basal portion as much stronger as it looks to be? When the fiber comes away from the seed does it come away at a definite junction point, at the base of the fiber, or is it likely under certain circumstances to break at a point further out on the fiber? Just how, when, and how fast does the twist arise? Does it come on suddenly or slowly? Can the degree of this most important property in any practicable way be brought under control? How much do the different varieties of cotton vary from each other in this respect? Does a given cotton vary in this respect from time to time? For instance, when the cotton is dry is the twist more pronounced than when it is wet? Are these fibers longer when wet, or shorter? What is the exact effect of humidification and why does it have this effect? To what extent do the fibers on the same seed or in the same variety of cotton vary from each other in length, strength, twist, taper, etc.? Can this relationship be altered by breeding?

These questions and literally hundreds of others arise as one thoughtfully contemplates a cotton fiber in its entirety To many of these questions there are at present no satisfactory answers. To many others there is no answer at all; to some there are pretended answers that are incorrect and misleading.

BEARING OF HUMIDIFICATION ON HAND TESTING

The following are accounts of two of my experiments showing the important bearing of humidification on the hand testing of cotton. That disputes with regard to the qualities of samples of cotton are common is not to be wondered at when such important facts are unknown and therefore not utilized.

Fibers from a small tuft removed from a single seed of cotton were broken under two different humidity conditions. The fibers were broken alternately "dry" and "moist," at intervals of two to five minutes during the day, one-half being broken "dry," the other "moist." The relative humidity during the tests varied from fifty-three in the morning to forty-five in the afternoon. The temperature varied from seventy in the morning to seventy-five in the afternoon. This variation in the relative humidity of the atmosphere and in the temperature was relatively small, and would be largely counterbalanced by the method of testing, namely, breaking first a fiber subject only to the prevailing temperature and humidity, and then a fiber subjected to the effect of the human breath during the breaking test, a period averaging about five seconds. The figures following give the average result of twenty-four tests in each case.

Tensile Strength of Individual Cotton Fibers

Subjected for five seconds to human breath	Broken at the prevailing temperature and humidity
61.4 grammes	40.9 grammes

Increase in strength in five seconds, 50.1 per cent.

One of the best known instruments for testing the strength of fibers is so constructed that it is almost impossible to use it without at the same time subjecting the fiber to this powerful influence of the human breath. The puzzling "vagaries" thus introduced have beyond doubt rendered worthless much of the testing done on this instrument.

Difference in strength of cotton fibers tested at a temperature of 73 in one case, and with humidity at a minimum of 80 (highest reading, however, 89), and in the other case temperature during experiment varying from 69 to 74, and the humidity constant at 41. In other words, the fibers were tested at practically the same temperature, but with a variation in relative humidity of about 40.

Average of 24 fibers	Humidity 80	Relative humidity 41
	100.7 grams	69.5 grams

The fibers were from a small tuft removed from a single seed, and were therefore as nearly as possible of the same character, and could justly be compared with each other under the conditions of the test. It will be seen that under the more humid conditions, the fibers gained approximately 45 per cent. in strength.

Friday evening was given up to the banquet in the large dining-room of the hotel, which was attractively decorated. The proceedings were opened by President Duncan, who made a short address urging manufacturers and business men to give greater attention to governmental affairs and legislation. He especially directed their attention to the reports of the Committee on Industrial Trade Relations, garbled accounts of which have been printed in the daily press from different members of the committee, each one of whom has in fact presented a different report and the general public has only heard the sensational statements of some of the more radical members of the committee. He urged business men to acquaint themselves fully with the details of these various reports and to do their part towards enlightening the public as to the true conditions in the industries to which they referred. The keynote of the evening's address was the closer relationship that should exist between business interests and the government with a view to exercising a beneficial and sane influence on legislation. After the addresses by Charles G. Bancroft, President of the International Trust Co. of Boston, and Senator John W. Weeks of Massachusetts, President Duncan called on Joe Newberger of Memphis, Tenn., to say a few words in closing. He aroused the audience to enthusiasm by promising the cooperation of the business men of the South along the lines advocated by the preceding speakers. Mr. Newberger is always a live wire in any gathering at which he may be present.

ADDRESS OF HON. JOHN W. WEEKS

In other times, when we have had good crops which have been sold at better than or even normal prices, when the foreign balance of trade has been in our favor, and when there have been large loanable balances in the banks, we have felt assured that we had all the conditions necessary to make good business. The crops of the United States last year brought more money than ever before in the history of our country, and there is a reasonable prospect that the money value of this year's crops will be as great. We have today the largest foreign balance of trade in our favor that this country has ever seen and the latest reports to the comptroller indicate that there are nearly three-quarters of a billion dollars of loanable funds in excess of the legal reserves now held by the national banks, without counting any excess that may be in state and private banks. Nevertheless, business, in other channels than those which are furnishing supplies for the war and businesses related to those supplying manufacturers, the automobile business, and some other specialties, is not normal in the United States. I believe it is reasonable and correct to say that the war has started more furnaces and more looms than it has stopped and, therefore, business would be materially poorer than it is now, and more men out of employment if it were not for the war.

This condition cannot, of course, be brought about by any one reason. The tariff has much to do with it and, also, many other conditions which are more or less potent; yet, I think the most effective reason is the uncertainty and hesitation which exists on the part of capital, a condition which is brought about by too much restrictive legislation and too much governmental interference with business; so that capital has become timid, it does not readily go into the development of industries which are already established, and does not go into new enterprises, even when they seem to present possibilities of satisfactory returns, as would otherwise be the case.

Under such conditions there are always considerable numbers of men out of employment and even now, although business is somewhat better

than it was in the earlier months of the year, there are large numbers of men who really want work and who are unable to get employment. This is true in all sections of the country and is especially true in those sections removed from the manufacturing centers where war suppplies are being manufactured and from the sections of the country which are essentially agricultural.

During the past five years, Congress and the state legislatures have passed about seventy thousand bills and there have been six hundred and fifty volumes of decisions of courts of last resort handed down within the same time. This, in itself, should be a sufficient reason for a desire to bring about greater care and scrutiny in passing new legislation. We are afflicted with a vast amount of unskilled and immature thinking which is reflected in the shape of legislation.

If the amount of legislation passed by Congress, barring that which carries necessary appropriations, were reduced five times and every bill of any magnitude which is passed were introduced a year before it is acted upon, during which time it might be submitted to trade organizations throughout the country for comments, then suitable hearings given on the legislation, I am confident that the results would produce all the necessary legislation which should be passed and, on the whole, it would be beneficial. While much legislation which is passed under present conditions may contain necessary provisions, as a matter of fact, it contains so many provisions which are harmful in some collateral way that the net result is bad instead of good.

The recent legislation, known as the Seamen's Bill, is a good illustration of this fact. It contains about twenty separate definite provisions; many of them relating to matters applying to the personnel of merchant ships and safety at sea, all of which might very well have been adopted long before this law became effective. In the earlier days, no one questions that seamen were, in many cases, unfairly and improperly treated, their food was not good, their berthing facilities were not sufficient, and in many other ways conditions were such that good men did not go to sea. From time to time these conditions have been modified, and in the Seaman's Bill at least a dozen of the twenty main provisions applying to this subject should meet the approval of everyone; but there was injected into the bill other matters conflicting with our treaties and harmful beyond description to vessel owners, the net result being that we have already, although the bill does not become effective for several months, swept American shipping from the Pacific ocean and turned over to the Japanese the carrying trade of that ocean as effectually as if we had passed a law prohibiting the sailing of American ships. We might have been warned that the Japanese, who have been taking the only effective means I know to build up a merchant marine; that is, granting reasonable subsidies, would seize this opportunity to take over the balance of our trade.

During the last three years the Japanese tonnage trading between China, Japan, and our Pacific Coast has increased from twenty ships with a tonnage of 84,725 tons in 1913, to forty ships having a tonnage of 145,176 tons August 1 of this year, and they are, in addition, building a very considerable number of ships which are to be put into the New York, Panama, and Pacific coast trade.

There are reasons for this kind of legislation. As I have suggested, there is too much careless rather than scientific thinking, and a great many good people have seen things which they believed needed correction and, following the habit of the times, they have rushed to the government to obtain legislation to correct them, contending that good results would be obtained if the legislation which they have advocated were adopted, never giving any reasonable consideration to the collateral or supplemental interests which might be effected.

Then, again, we are all, as citizens, responsible for this vast volume of legislation because we expect that those we send to the legislature or to Congress will do something in a legislative way to demonstrate a reason for their re-election, which most men desire and which from the public standpoint, is for our best interests legislatively, for the longer a man serves, if he is diligent and studious, the better able he is to give his constituents beneficial results. Therefore, the new Congressman, who, under ordinary circumstances, cannot be a very important element in legislative affairs, introduces legislation urged on him by some of his constituents of the kind to whom I have just referred and if he is active and fortunate, he may get some legislation of the description I have given on the statute books. If he does not do this, when he comes up for re-election, we are apt to say, "What has he done to deserve it?" and especially if he has not made speeches for distribution among his constituents. Those are the two main reasons on which he bases—because we do—a reason why he should be returned. Very likely the speeches he made took the time of Congress without affecting a vote and it is more than probable that there are a large number of men in Congress who could have made just as good speeches on the subjects which he has discussed: so instead of inquiring whether he has done good work in examining legislation which came before the committees to which he is assigned, whether he has been instrumental in saving money which otherwise might have been appropriated and spent without adequate results, or whether he has been looking on broad national questions in such a way that he has been of real assistance in promoting some great national policy, like preparedness or legislation which would develop a merchant marine or some such question, we use the other and less substantial reason, therefore encouraging him to do the things which he should probably avoid.

I do not mean by all this to be unduly critical of those who desire to obtain legislative results, because there are always matters which require readjustment, and an unqualified believer in action would never accomplish anything in correcting such conditions. It is the man who sees the error clearly and who sees the correction as clearly, who moves the world in the right direction. But there are very few who have had experience enough to take such a position without the most insistent and thorough investigation; so I have made the

suggestion that if legislation could be introduced long before it is passed and carefully considered by every possible interest, that, in effect, would be putting to it an acid test which would result in good rather than bad legislation.

There has been an epidemic in the desire to turn over to the government those things which are not essentially governmental but which are paternalistic and which cannot be done as well by the government as they could be through private initiative and personal or corporation management. No government was ever established for the purpose of doing business. It is an extravagant and inefficient business agency and lacks expedition in all of its operations. It is necessary in order to properly protect governmental operations that the law shall definitely provide just how it shall be carried on. This produces a degree of red tape which is imical to every condition which goes to bring about satisfactory business operations.

Very few people appreciate the degree to which we have been rushing into paternalism in the last few years. It would take too much space to enumerate them but we are rapidly turning over to commissions, which in turn employ a large number of agencies, many operations which necessarily is building up a governmental force of inspectors which, unless it is checked, will in time—and no distant time either—add very materially to the burdens which will be imposed on our citizens for the maintenance of these governmental forces. It is a condition which may develop as did a similar procedure in France, during and immediately following the French Revolution, when it is said that there was one governmental employe to every four citizens, loading down the tax-payer with obligations too heavy to be borne, so that the whole system was necessarily and radically revised.

SOME LABOR PROBLEMS

Charles G. Bancroft, Esq., President, International Trust Company, 45 Milk St., Boston, Mass.

The problems confronting the members of your organization with reference to the labor question, are more complicated and serious, in my opinion, than are met by any other class of employers. The very nature of the business makes necessary a large initial investment and the organization of a perfectly adjusted corps of able and skilled men, as well as the assembling of the rank and file of workers in large numbers. The development of the industry and size of the units necessary to success call not only for manufacturing ability but for experience in affairs of finance and business. Land, substantial buildings, power plant and machinery, together represent in the textile manufacturing field an investment larger in proportion to the value of the output than is found in other manufacturing enterprises. Before a wheel is turned or a thread is spun, or a yard of cloth is woven, a fortune of large proportions must be invested. In the days of the spinning wheel and hand loom the industry was on a level, in so far as investment was concerned, with others; but with the advent of power loom and preparatory machinery came the necessity for large investments of a permanent nature, and the building of an expensive supervisory organization. With the factory system came immobility, and with this anchor of heavy permanent investment came large overhead expenses running on just the same whether the wheels were turning or not. An idle plant means rapid deterioration, continued fixed charges, disorganization and great loss. Money invested in plant not working not only is itself lost, but that it may be saved calls for help from other money; and thus you have often been confronted, when threatened with labor troubles, with the necessity of deciding not as to which of certain alternatives presented would permit of making the greater profit, but which would entail the least loss. Your industry is a fixed quantity. You must deal with conditions as you find them. You cannot, in the event of a strike or other trouble, pack your tents and, like the Arab, silently steal away. You have given hostages to industrial warfare in your ownership of land, of buildings and of machinery. You have taken the money of your friends for the investment, and it is absolutely a case of fighting it out on the field which you have selected.

Thus, to your industry more than to any other is the labor question important. The shoe manufacturer who can rent his plant or have its use donated by some generous board of trade, leases all of his machinery with little, if any investment, and who has, in many instances, started in business on a capital of not more than $5,000, can, if the clouds of labor discontent grow too dark, seek another location where conditions are more favorable and make the change without great expense. And to some extent, I think these conditions may be responsible for the fact that while textile operatives have often been extremely unreasonable or unjust in their demands for restrictive legislation, those employed in shoe manufacturing have sought the enactment of measures through the invocation of which favorable settlements might be reached by arbitration or conciliation; but other causes of aggressiveness on the part of labor may be found in your business. With the influx of foreign operatives you have taken into your establishments in the past men fresh from the hotbeds of unionism in England, bringing with them old world ideas of antagonism and distrust by employe for employer. This is the source from which a large part of our textile labor legislation has come. Some of it has been beneficial, some harmful. There is more of it in the air. The question is how to best meet the situation. You are trustees for your stockholders. You are using their money with the understanding that if possible a reasonable profit from the investment shall be secured for their benefit. You have no right to take from them to give to others, and so it is your duty to use your best endeavor to prevent the passage of laws which will bring bankruptcy to your business, and loss, sorrow and suffering to your stockholders.

The word so much in the mind of the public expresses better than any other the policy which must be pursued by you, that word is "preparedness," which word means a consideration of all the facts, a sober and fair determination as to just how far restrictive legislation can go without endangering the industry, a thorough analysis of

public opinion, a thoughtful study of everything on which public sentiment has been formed, a full recognition of such errors as have been omitted in the past, and the adoption of a comprehensive plan as a result of which the public will know they are getting the facts. In other words, you must get the public with you. It is inconceivable that public sentiment once really enlightened would favor measures which not only are a menace to business, but as well, deprive our citizens of fundamental God-given rights.

This problem is big enough and important enough to engage your most serious attention and the thought of your best minds. Preparedness means that you should when times are tranquil and relations harmonious secure for every department of your plant at least one person whose business it is to represent to the men your side of these questions; to see that they are enlightened in every way possible as to the danger for all in too extreme measures, to tell them the truth and nothing but the truth, but get them in a frame of mind, if possible, where trust and confidence will take the place of distrust and suspicion. If necessary, arrange for periodical conferences between men from the various departments and those responsible for the conduct of the business. Do not depend on absent treatment.

While I realize fully the demands made upon your time and strength in the management of the great enterprise for which you are responsible, I do not hesitate to say that, with few exceptions, you have sadly neglected your duty as citizens of the communities in which you live in that you have failed to make your influence felt in political committees, in the selection of candidates and in the discussion of public questions. The contribution of money to help the cause is useful, but personal interest is far better. It is a sad statement to make but unfortunately true that the lowest percentage of total votes cast in any ward, city or town in Massachusets, is to be found in that section of Boston where more mill stocks are owned than in any other locality of like size. The butler, the coachman and ashman vote, but in nine cases out of ten, their employer has not even given them the benefit of his opinion as to the merits of the candidates or a suggestion about principles involved. Preparedness means that you must carry on perhaps for years a campaign of education in sundry ways. Among other methods a series of moving pictures showing the well-known beneficial effects of the textile industry on the various nationalities as they have progressed from poverty to plenty and from ignorance to enlightenment, would be helpful. A real effort to lift the operative to a higher level through social welfare work, with the publicity that would naturally ensue, would tend to inspire confidence. Newspapers, magazines and other channels must be used. A lesson may well be drawn from the present campaign of publicity being conducted by the brewing interests, which, alarmed by the increasing prohibition sentiment, are expending large sums of money in what appear to be the most effective methods of enlightening public sentiment from their standpoint. If upon investigation, it should be found that, the world over, there is anything fundamentally wrong in the state of employment in your industry, the problem could not be in more capable hands for solution. These things, however, should first be studied thoroughly by a committee to be chosen from your own members, and sound conclusions once reached, the importance of the problems should insure your prompt action. If absence of tariff compels low wages, if proposed unnecessary restrictive legislation causes expense that must be borne by labor, or if other action becomes a menace, it is your duty to personally appear before committees and to interview legislators; to go on the stump if necessary, to write for the papers, and in every way possible show how vital and important the question at issue may be. You would not think of asking a lawyer to try a case in court without witnesses. No more should you expect him to impress a legislative committee without producing the real parties at interest. You do not like to be badgered and misunderstood, to be held up as one who would degrade mankind, and rob innocent women and children of health and happiness, but in the present state of public opinion there is no choice. You are being attacked and maligned not only in sensational newspapers, but as well by magazine writers, economic societies, and ministers of the Gospel. It has become more than a business question with you. Your humanity, good citizenship, and personal honor are being assailed. As a class, you are being held up as enemies of society. If one-tenth of the accusations are true, the condemnation is merited. Fortunately, however, we know what gross exaggeration and misrepresentation have characterized the greater part of the attacks which have been made. There are instances in which employers ignore and defy the law. There are grasping, greedy and avaricious individuals in the cotton business as well as in other lines of endeavor. There are persons who will not keep step with the march of progress in any movement, but that the proportion is larger in your industry than in others can and should be emphatically denied. I believe that, for your own honor and that you may leave to your posterity the good name rather to be chosen than great riches, a vigorous and constant fight should be waged against the forces which seek to place upon you and your industry the stigma of inhumanity and avarice.

A studied plan seems to have been followed to exploit every short-coming and to treat isolated cases as typical of the whole. It might as well be said of the community in which I live that it is a dishonest town because there may be found within its borders one or two men who steal as to make your industry as a whole responsible for the faults of a few. The time has passed when you can sit quietly by and expect the situation to right itself. Open aggressive action on your part is necessary; action not only against sensational exaggeration and exploitation for political and newspaper profit, but as well against the employer who permits conditions on which criticism can fairly be based.

The late Hon. Carrol D. Wright, in his admirable work entitled some ethical phases of the labor question, used these words in speaking of the general effect of factory employment, "the factory is performing the same civilizing operation

for the new quotas that it has always performed for the others. It is reaching down and down to the lower strata of society and lifting them up to a higher standard of living," and again he quotes Cooke Taylor, "Those who were called the fathers of the system were not such demons as they have sometimes been described, nor yet were they perfect angels. They were simply men of great intelligence, industry and enterprise. They have bequeathed the system to this age, with the imperfections incident to every human institution; and the task of harmonizing their innovation with existing institutions, and with the true spirit of righteousness, belongs really to the great employers of labor rather than to the professed teachers of morality."

The fourth and last session on Saturday morning began with the reading of technical papers as follows: "Ball Bearings for Cotton Mills," by Elliott A. Allen, of the S. K. F. Ball Bearing Co., New York, who gave a complete analysis of the ball bearing situation as applied to cotton mills, and "The Development of the Use of Natural Dyestuffs," by Edward S. Chapin. The discussion which follows Mr. Chapin's paper showed plainly that the dyestuff situation problem was uppermost in the minds of those present at the meeting. Dr. Matos made a very clear and interesting statement of the dyestuff situation and warned the trade against placing too much confidence in an early solution of the question. He said that the manufacture of dyestuffs was at present made difficult by the demand for the necessary raw materials from the manufacturers of explosives. Dr. Matos stated that it would be necessary for the universities of the country to train men for the chemical industries, as had been done in Germany. He added that the patents had expired on 600 of the 900 coal-tar dyes manufactured.

Mr. Baker, of West, Baker & Co., asked Dr. Matos whether it was not possible for the United States to establish a domestic dyestuff industry within a few years, assuming that the Government at Washington gave the business adequate protection by means of a tariff and in other ways. In reply Dr. Matos stated that he thought the establishment of such an industry was feasible under such conditions. Mr. Baker then stated that Dr. Matos' reply showed plainly that the need was for a business administration at Washington, a call for which had been sounded at the banquet on the night before and which would give the necessary protection to the dyestuff industry. Mr. Chapin then rose and stated that for years the dyestuff manufacturers had appealed in vain to successive Congresses for protection to their industry. Their appeal was refused because the cotton manufacturers had unwisely joined forces with the importers of dyestuffs in preventing adequate protection from being granted. He told of a New England manufacturer who refused to buy an American product just before the war because he could buy it for one-eighth of a cent less per pound from Germany. After the war started the same firm wanted to buy the American material, but found then that the supply was not available. Mr. Chapin knew of several American patents on dyestuffs that had been sold to German dyestuff manufacturers because it was impossible to manufacture the materials in the United States without adequate protection.

The next paper, "Scarcity of Dyes and Chemicals During the Present War," was read by title, the author, Dr. I. V. Stanley Stanislaus, being absent. This paper will be found in another part of this issue.

The paper, "Cotton Opening Machinery," by Frank Nasmith, Manchester, Eng., was read by title in the absence of the author.

H. B. Twyford, of New York, then read a paper on the "Purchasing and Storing of Materials and Supplies for Cotton Mills," which will also be found in another part of this issue.

Following the reading of the papers, E. W. Thomas, of the Committee on Resolutions, presented the following petition to the President of the United States, the Senate Committee on Finance and the House Committee on Ways and Means, which was adopted:

To the President of the United States, and to the Committees of Finance on the part of the Senate, and of Ways and Means on the part of the House of Representatives:

The National Association of Cotton Manufacturers respectfully calls to your attention the following facts in reference to the increased importation of cotton cloth and of manufacturers of

wool during the months preceding the outbreak of the European war:

Imports of cotton cloths under the Underwood-Simmons Tariff for the nine months before the war began compared with figures under the Payne-Aldrich Tariff Law as follows: Under the Underwood-Simmons law, $10,370,161; under the Payne-Aldrich law, $6,176,454.

Imports of manufactures of wool for the six months ending June 30, 1912, under the Payne-Aldrich law, $6,754,771; 1913, under the same law, $7,627,199, and 1914, under the Underwood-Simmons act, $24,173,980.

It is evident from these figures that the reduced duty of the Underwood-Simmons law brought about an immediate and notable increase in the importation of cotton cloth and of manufactures of wool.

The imports of cotton cloth increased 100 per cent., and for the total period of nine months there is an increase of 68 per cent. In the case of the manufactures of wool, the increase is even greater, the imports for six months of 1914 being nearly four times as much as the imports of the same period of 1912.

Our cotton and woolen mills are capable of supplying at reasonable prices the entire needs of the American market. Any such increase in the importations of staple textiles as occurred before the outbreak of the war must result in the curtailment of American production and in distress to the wage earners of our textile mills.

When the war closes the American market will be eagerly sought by the European nations as a means of restoring their shattered industries and recovering their commercial prestige. The world's fold is pouring into our coffers and Europe will seek to replenish its depleted supplies by sending to us enormous quantities of manufactured goods.

Competition for the American market will result in the fiercest warfare that the world has known and the wise solicitude for our national welfare prompts such a revision of our tariff laws as will place the nation in a state of preparedness against an invasion of foreign goods.

"Already" is our motto. This to be, "America first." Then, we respectfully urge your earnest attention to the danger which will threaten American industries unless tariff duties are adjusted to the new conditions, and to the growing demands for increased revenues, which should be put into effect in place of duties based upon entirely different conditions and circumstances.

Resolved that a copy of these resolutions be sent to the President of the United States, to the chairman of the Finance Committee and the Chairman of the Ways and Means Committee.

Following is a list of the new members elected:

For Active Membership

Fuller E. Callaway, President Manchester Cotton Mills, La Grange, Ga.

H. F. Grinnell, Chace Mills, Fall River, Mass.

Thomas E. Heatley, Superintendent Maverick Mills, East Boston, Mass.

Fred L. Heyes, Agent Nonquitt Spinning Co., New Bedford, Mass.

H. B. Huntoon, President and Treasurer, Providence Braid Co., Providence, R. I.

Edward Lovering, Treasurer Massachusetts Cotton Mills, Boston, Mass.

George Nichols, Treasurer Chicopee Mfg. Co., New York City.

G. M. MacWider, Chemical Engineer, Corn Products Co., New York.

Theodore Wood, Agent American Yarn Mfg. Co., Pawtucket,, R. I.

Alan V. Young, Manager Hamilton Cotton Co., Hamilton, Ontario, Canada.

For Associate Membership

Anthony L. Benachi, Choremi, Benachi & Co., 53 State. St., Boston, Mass.

A. W. Chippendale, Treasurer E. A. McMillan Box Co., No. Adams, Mass.

John R. Fordyce, Little Rock, Ark.

Geo. W. Foster, Universal Wind. Co., Providence, R. I.

Parkman D. Howe, Secretary Saco-Lowell Shops, Boston, Mass.

Gilbert V. Pennock, Eustic, Pennock & Co., Boston, Mass.

Henry W. Roth, of George H. McFadden & Bro., Providence, R. I.

Joseph Newburger, Newburger Cotton Co., Memphis, Tenn.

The baseball game on Friday afternoon attracted many to the field near the hotel, where the Reds captained by John R. Mitchell and the Blues led by Frank Woolley battled for supremacy, the victory finally going to the Blues with score of 16 to 3. A cup was presented to Captain Woolley of the winning team by Stephen C. Lowe and a cup was also presented for the best batting average to Roger Wattles by Thomas F. Glennon. On Saturday afternoon a picked team from the Textile Base Ball Association played a match with a nine from the Philadelphia Yarn Salesmen's Association. The combination nine made up from the Reds and Blues was victorious with a score of 18 to 2. Cups for individual excellence in batting and fielding were presented by L. T. Shurtleff of the Pairpoint Mfg. Corporation.

The golf members tried out their skill on the Shennecossett Club Course on Friday and Saturday afternoons. The result of the two days competition gave the cups offered by the Board of Government to E. T. Manson for the best gross score and to William Clark of Westerly for the best net score.

The competition for the tennis trophy offered by Charles T. Plunkett was fought out

between a dozen members. The cup was won by Philip Dana of Westbrook, Me.

The success of the meeting is largely due to the energetic and efficient work of the Committee on Meeting who lent most valuable aid to President Duncan and Secretary Woodbury. The committee comprised Charles H. Fish, chairman; Nathaniel F. Ayer, Thomas F. Glennon, Franklin W. Hobbs, Stephen C. Lowe, Frederick W. Parks.

THE PREVENTION OF ACCIDENTS IN COTTON MILLS

John Calder, President, Manufacturers Equipment Company, Boston, Mass.

I do not propose to touch here on the subject of compensation for accident. Indeed, I do not believe that a compensation burden on an industry is in itself the creator of the best accident-reducing conditions, though the excellent technical assistance of the safety experts of insurance undertakers has been beyond question helpful. The wave of interest due to the recent incidence of this new economic burden upon the cotton industry is bound to subside, and sooner or later the consumer will foot the bill. As a matter of fact, it is not in the mill counting house, the state house or the insurance office, but in the mill itself and amongst the responsible executives there that we must look for the initiative that will procure the reduction of the present accident rate in cotton manufacture and a corresponding relief in compensation payments and insurance cost, not to speak of the moral gains.

It is well known that the economic factor has been and must still be the mainspring of the cotton manufacturers' progress as of all other industrial enterprises, but this does not shut out consideration of employes whose health and safety affect the long result. To an extent regretted by all mill owners, the mill is still to many of its operatives only a stepping stone and the seeds of precaution and of safety habits have to be sown largely on a moving soil.

For the statistical portion of this necessarily limited discussion I confine myself to the accident returns from the cotton mills of Massachusetts whose records are well maintained and whose casualty experience is not the least favorable to the industry. What then is the extent of the reported injury sustained in the cotton mills of that State which represents the most advanced safety practice in the industry? These mills employed between July 1, 1912, and June 30, 1913, an average of 112,384 operatives, of whom nearly one-half were females, and in that time 7,489 casualties were reported. Fatalities do not figure prominently in the cotton mill risk. In the above, thirteen males—two of them minors—were killed, and 7,476 persons more or less injured; the injury ratio being 66 per 1,000 employes per annum. Seventeen hundred and sixteen (1,716) of the accidents or 23 per cent. occurred to females. Specific mutilation was sustained in eighty-one of the non-fatal accidents and involved the loss of four eyes, two hands, one foot, two or more fingers in twelve cases; one finger in sixty cases and one toe in two cases. The other injuries varied from serious wounds and contusions to trifling hurts involving no absence from work.

The disability due to these injuries was under two weeks in over 76 per cent. or in 5,711 cases; two to four weeks in 862 cases; four to eight weeks in 564 cases; eight to thirteen weeks in 205 cases; thirteen weeks to six months in 113, and over half a year in twelve cases.

This in brief is what happened in one year in the cotton mills of one state, and any helpful study of prevention involves the further questions: Where did these accidents occur, how and why, and what can be done in the premises?

Owing to the supreme place necessarily occupied by machinery in the cotton industry, it is desirable to isolate at once all trivial occurrences and these beyond remedy from physical safeguarding though not necessarily unpreventable by better supervision and instruction. When this is done we find that in Massachusetts in one year the three chief mechanical elements in all mills, viz.: belting, shafting and gearing, caused three times as much lost time per employe in cotton mills as in the thirteen other leading industries (Table 1), and the element of gearing alone was four and one-half times more dangerous.

TABLE 1

Days Lost Time From Injury Per 1,000 Employes

Cause of Injury	13 Industries	Cotton Mills	Ratio
Belting	21.7	43.6	2
Shafting	12.4	30.2	2.4
Gearing	21.1	98.2	4.6
Total	55.2	171.9	3.1

If we compare the lost time in cotton mills from the above causes with that in another industry also using much machinery, we find the ratio over five times and the special item of loss of time from gear accidents nearly thirty-four times.

TABLE 2

Days Lost Time From Injury Per 1,000 Employes

Cause of Injury	Shoe Industries	Cotton Mills	Ratio
Belting	20.0	43.6	2.2
Shafting	7.7	30.2	3.9
Gearing	2.9	98.2	33.8
Total	30.6	171.9	5.6

Such economic facts should lead cotton mill owners not to rest on past achievements, but to organize more thoroughly than has been done to reduce these losses and others which they imply on both employer and employe. There are not lacking indications that the burden of the industry of compensation premiums will shortly be increased, owing to alleged unfavorable experience with the cotton mill accident risk.

In the cotton indusry the amount of machinery investment per employe is much larger than in most others, and its speed and intensive use for production increase the chance of injury to operatives from machinery sources. The inherent mechanical risk of the industry is well recognized and is further illustrated by the analysis in Table 3 of 557 textile accidents reported consecutively in Massachusetts.

It was noted that in 192, or about a third, of these injuries, no lost time was caused; in 277, or one-half, the absence was under two weeks, and in 88 cases, or about 16 per cent., disability extended over two weeks.

It is not my present purpose to go into the details of the well-known methods for preventing, by more physical safe-guards, a number of these accidents, but rather to urge such executive interest as will secure their constant application and improvement. The comparison made in Table 2, between cotton mill and shoe machinery gearing accidents, illustrates the results where the commercial responsibility for the safety conditions on leased machines lies wholly in the hands of the maker; in this case a single large corporation with a well-deserved reputation for care in this matter. On the other hand, though cotton mills might copy with advantage many of the protective precautions adopted with gears in the shoe industry, the cotton accident risk is distinctly increased by reason of the multiplied places at which a single worker may receive injury as compared with a shoe machinery operative. These considerations are mentioned in order to make fair comparisons, which cannot be done by quoting statistics alone.

It is worthy of notice that 120 of the above accidents or more than 20 per cent. of the total, occurred while operatives were cleaning machinery in motion, a cause of accident much more prominent in the textile industry than in any other. The technical necessity to clean at frequent intervals in order to maintain quality and quantity of product, the economic disadvantage of idle machines, the interest of employe, employer and frequently overseer in the earnings due to absence of stoppages, all tend to make cleaning in motion one of the problems of industry. So difficult has it been to prevent such dangerous employment even where both the intention and the action of the management have been directed towards safety that mechanical solutions of the difficulty have been sought. Where no strenuous effort is made administratively to check cleaning in motion, it goes on daily as a matter of course with inevitable accident.

TABLE 3.

ANALYSIS OF PARTS CAUSING 557 CONSECUTIVE ACCIDENTS.

Machinery	Mechanical Elements Involved.								
	Rolls. Cyls	Gears.	Belts. Pulleys.	Chains. Sprockets.	Pulleys. Flying Shuttles.	Fliers. Bobbins. Spindles.	Miscellan's Revolving Parts.	Miscellan's Reciprocating Parts.	Total.
Openers and pickers,	6	4	5	1			4	2	22
Cards,	21	19	7	2	1				50
Lappers,	7		2				7		16
Combers,	8	2					3		13
Drawing,	7	6						7	20
Speeders,		14			1	25			40
Spinning; twisting,	18	12	5			55		2	92
Winders; quillers,	3	3	2			2			10
Reelers,					1	1			2
Slashers,	3	3							6
Beamers,			2				2		4
Mules,			6				5	4	15
Looms,	4	15	7		33			117	176
Marline-layers,				1	1	2			4
Dye plant,	19	2		1					22
Printing,	2	2							4
Calenders,	8								8
Cloth winders,	4								4
Folders,								21	21
Shearers,							5		5
Miscellaneous,	3	3	5			2	8	2	23
Total,	113	85	41	5	37	87	34	155	557

The administrative solution demands a good deal closer supervision and education of employees than overseers, as a rule, have been able or willing to give to the matter, and, unless mill owners take up the issue vigorously, little improvement can be expected from executive handling of the class of labor now available for textile operations.

The mechanical solution is a sure remedy for a number of the frequent injuries due to cleaning in motion. It involves considerable expense. It will not take care of the risk due to permitted cleaning in motion of main line shafting and transmission, but it does solve a large part of the cleaning accidents. It consists in developing interlocking machine and gearguards which automatically prevent the application of power to any machine while the guards are removed or are opened up for cleaning purposes. There is noth-

ing new in the principle, which has long been applied to military apparatus and many other types of dangerous appliances. It is applicable alike to gearguards, roll covers, clothed cylinders and parts running at high speed which can cause serious injury even after the power is shut off. Machinery builders will gradually standardize such appliances if mill owners will take the initiative and specify them on new machinery, but they are sure to be omitted if the buyer exhibits no interest in this regard. Interlocking devices have already been applied to openers, pickers, cards, lappers, doublers, drawing, slubbing, roving and ring spinning frames, etc. Wherever they have been insisted upon they have been forthcoming, and it is a significant commentary on the influence of factory legislation in effecting improvements that twenty years ago Russian cotton mills were importing safer machinery than we now use because of the strict safety regulations under which that nation permitted the exploitation of the Moujik in its textile business.

Wonders in accident prevention have been already accomplished by plant owners in other industries, comparing in every respect with the experienced, intelligent and privileged men who own and operate our cotton mills. The textile industry owes it to itself to get busy on this matter and I have no doubt that, as the consumer must foot the bill in the end, the nation will not be unwilling to bear a share, though it will probably, in the future, scrutinize most closely the itemized particulars of any claim for assistance.

This analysis of cotton accidents and their prevention would not be complete without frank recognition of the moral risks involved in the industrial world. I have investigated many thousands of accidents, both in the textile and non-textile industries, and the blame is pretty evenly divided between careless employees and neglectful employers. The chief causes are ignorance, carelessness, fatigue, unsuitable clothing, insufficient lighting, unsafe structures, obstructed and defective floors, dangerous machinery, dangerous operations, absence of safeguards, and not least, absence of safe-working supervision.

In a great many instances the carelessness and ignorance of operatives are contributory and cannot be off-set by physical safeguards or legal enactments, but they can be greatly reduced by painstaking instruction and supervision. The National Safety Council, and the affiliated Boston Safety Society of which your worthy President is a vice-president, consists of employers in every description of industry and their responsible executive and engineers who have set themselves to get at the truth about industrial accident and who will accept nothing but facts. They have got them a plenty. They are after "prevention" not "cure," and they include in their membership the best safety experts in the country who give their services and advice to the council, free of charge, for industrial betterment.

What our textile mills need in the first place is an awakening of interest amongst mill superintendents, foremen and overseers in safety work. In spite of the age of the machine cotton industry and its long acquaintance with accident, it has not taken the place it should have done in the modern safety movement. It was the first to experience and combat the industrial dangers due to power industry and it ought to be in the front rank today in cooperating with other industries in solving what is a common problem, which demands enlightened executive action, rather than reliance upon pressure from the State, which can never be more than an advisor and inspector of performance. The safety committee on which operatives from various departments serve, along with executives, the Safety Suggestion System, the organization of workers against dangerous practices, are conspicuously absent in many cotton mills where more expensive attempts to safeguard are not lacking. We need to take greater advantage of our moral resources in the mills and to profit by the increasing knowledge about the psychology and physiology of industrial accidents.

In all the work the societies I have mentioned undertake, they lay emphasis upon the conversion of mill executives to an active propaganda and on the absolute necessity for socializing the safety movement, which required for success the pooling of industrial accident experience and a cooperation of forces which no legislation can procure. When the cotton manufacturer has complied with the minimum legal safeguarding provisions and has posted various prohibitory notices in his plant and drawn the atention of overseers to the state restrictions upon employment about machinery, he has only touched the fringe of the subject. It is still necessary for him frankly to recognize and apply his mind to the continuing casualties in his own and other mills, to challenge every assertion that reduction is impracticable and to be the foremost in inoculating his staff with a spirit of hopefulness and ambition in all matters of industrial betterment.

If the man higher up does not find time to do this, then nobody will, but, if he becomes a convinced advocate of the new safety measures and realizes his privilege and responsibility, he will effect changes which will react upon the whole spirit of his establishment and will greatly aid in the solution of the admitedly serious difficulties at present experienced in training and retaining the only labor now available for textile operations.

ARE THE TEXTILE SCHOOLS DOING ALL THAT SHOULD BE EXPECTED OF THEM?

Arthur N. Sheldon, Industrial Trust Bldg., Providence, R. I.

When I wrote our President some weeks ago, expressing a few casual thoughts concerning the scope of our textile schools, he suggested that perhaps a brief paper on the subject might prove interesting and possibly evoke a discussion as to the desirability and practicability of expanding these schools, and as the subject seems to me one of vital importance to our textile industry, I assented to President Duncan's suggestion in order that the subject might have the consideration of everyone interested. A free and candid discussion of it should quickly develop what points, if any, are worth further consideration.

Let me say in beginning, that I am not criticiz-

ing or depreciating the work done by, or the value of our textile schools. They are filling an important place in our textile industry today; they are of great benefit to ambitious mill operatives, as well as to young men preparing for the higher positions in our mills; but these schools could be expanded into much more useful institutions. With their present limited equipment, their function is restricted to dealing with only the more elementary problems.

I can see no reason why our textile schools should not be broadened in scope, approaching in their own field our greater universities and engineering schools; having on their faculty men enjoying the highest reputation in the various branches of the textile industry, and for their equipment sufficient machinery to work out in a practical manner the problems which are constantly arising in carding, spinning, weaving, dyeing, finishing, etc. I think it will not be denied that the textile industry of today is in greater need of men with technical training than ever before. Whereas in the past our superintendents and agents, generally speaking, have had to depend on a practical training entirely, often laboriously worked out, and necessarily limited, the time has come, I firmly believe, when a technical and practical education are both equally important, and, in fact, necessary, to meet successfully the extremely diversified requirements in the textile field. This must not be construed as in any way depreciating the value of that practical training by which many of our ablest manufacturers have advanced the industry to its present day status, but had these same men had the advantages of a technical education, who can say how much more prominent would have been our position today in the textile industry of the world; and, as I see the conditions today, the ever-growing competition of home and world markets, and the increasing refinements in all branches of the art, we must give more and more attention to our technical training if we are to advance or even hold our own.

From a fairly broad observation, I am led to believe that our textile industry today is in many instances conducted on a basis far from scientific, with little or no conception of the laws of cause and effect, and while I realize that the nature of the industry is such that it can never, perhaps, be reduced to an exact science, nevertheless, there is too much superficial knowledge, and too little scientific research connected with it.

I will give a very elementary illustration: Not long since we had occasion to draw up a schedule of machinery for spinning coarse yarns for a certain fabric. Our client was already operating a mill successfully making these same yarns, but in the new mill they wished to make a yarn of a little better quality, and, if possible, without increased cost, which would make a better appearing garment. The older mill had no combers, three processes of speeders, and spun from double roving. For the new mill it was suggested that combers be installed and the third process of speeders be omitted, to offset, in a measure, the expense of combing. The question then immediately arose how much waste should be taken out in combing to secure the desired result, and what effect on the final quality and manipulation of the yarn the omission of the third process of speeders would have No doubt, combing would make a cleaner product, but would this combing and two processes of speeders with longer drafts give a better, or even as satisfactory a yarn as with no combers and three processes of speeders, with shorter drafts? Or, would it be better still, perhaps, with two processes of speeders to spin from a single, instead of from double roving, in order to use shorter drafts? Here, then, were three methods of manipulating the raw product:

1. Combing, three processes of speeders, and spinning from double roving.
2. Combing, two processes of speeders and spinning from double roving.
3. Combing, two processes of speeders, and spinning from single roving.

Either one of these methods was entirely practicable, but bearing in mind that the present mill had no combers, three processes of speeders, and spun from double roving, which one of the above three systems should be adopted to secure the particular result desired? Of course, combing, and three processes of speeders would give a better quality of yarn than before, but at increased cost; but would methods 2 or 3 be satisfactory? Each one requires a different machinery equipment, and consequently a different interest and depreciation charge, and also each one involves a different labor cost. Competition compels us to keep these charges at a minimum, and yet, on the other hand, in this instance, if we sacrifice quality for cost, competition again eliminates us from the markets.

Pursuing the same thoughts in the above example, perhaps a different grade of cotton might be used to advantage, or maybe lighter carding or double carding would bring about the desired result. It might be interesting to mention that I wrote several practical manufacturers in regard to the above problem, and was surprised to receive such diverse opinions as they expressed. Some advised three processes of speeders, and some only two, while still others advised spinning from single roving.

Now, there must be one certain treatment of the raw product to accomplish the particular result required; more than this means needless expense, while less mean inferior quality. It may be suggested that each concern should work out such problems themselves, but this is not always feasible or possible. Oftentime, they would not have a proper machinery equipment to do so, and such experiments, if thoroughly conducted, would disorganize, in a measure, the regular operations of the mill. The illustration given above is only one of many occurring every day in spinning and weaving, bleaching and finishing, of cotton, wool, silk, mohair, etc., and I think we are all familiar with the crude and unscientific methods employed in many of our dyeing establishments, and other finishing plants.

It would seem to me, therefore, that here is a broad and useful field for our textile schools. Expand them into resetarch laboratories where such problems can be carefully and scientifically studied and worked out, at the same time providing thoroughly equipped institutions where our manu-

facturers of the rising generation may receive a liberal technical education. I realize that the consummation of such a scheme involves the expenditure of large sums of money for equipment and maintenance, but I firmly believe that the benefits derived therefrom, broadly speaking, for the textile industry of our country as a whole, would be commensurate with the cost.

How to provide for the equipment and endowment of such schools is a matter for further consideration, but it had occurred to me that since our manufacturing plants would be the chief beneficiaries, they should contribute collectively towards their establishment and maintenance. Then, each mill giving its support would be privileged to use the school equipment for working out its own problems either by having the students carry on the experiments, or if they should prefer, have a few competent men in their own employ carry out such investigations as they wish to make for their own particular and private use.

The above is only a brief outline of my thoughts on this subject, and I realize is an inadequate presentation of so important a question, but if I have said enough to interest our manufacturers more vitally in this subject, this paper will have served its purpose.

COOLING PONDS FOR CONDENSING ENGINES

Lee H. Parker, President, Spray Engineering Co., 93 Federal St., Boston, Mass.

The pollution of river water by waste products from manufacturing processes, thereby rendering it unfit for use in condensers, led to the English practice of constructing cooling ponds from which condensing water was drawn and to which the hot water from condensers was returned, thus using the water over and over again.

In order to utilize the surface of the pond as efficiently as possible a series of partitions were arranged so as to cause the incoming hot water to travel over the entire area of the pond before reaching the point from which the supply for the condenser was drawn. Some ponds of this character are still in use in this country.

Natural ponds were sometimes used for cooling purposes, and when so used, were equipped with wooden troughs constructed so as to deliver the hot water at a considerable distance from the intake well, the latter showing a peculiar five-pointed star arrangement distributing troughs.

As the cooling obtained with such ponds was very small, except in winter, other devices were sometimes added in an attempt to increase the cooling, such as a rack filled with brush at one end of the pond on top of which the hot water is discharged.

Later, so-called natural draft cooling towers were developed, consisting of a structure filled with grill work for breaking up the water into drops on its passage from a system of distributing troughs on top to a basin below, a current of air being induced through the structure by means of a chimney. A typical forced draft cooling tower consists of a circular steel shell filled with small drain tile or other material assigned to present a large surface for water distribution and contact with air which is forced through the tower by means of large disc fans located at the base of the tower and generally driven by means of motors.

As cotton mills are generally located with ample grounds around them, cooling ponds with or without partitions or distributing troughs have been used to a large extent in this country, especially in

LEE H. PARKER

the Southern States where the typical cotton mill has a natural or artificial cooling pond adjacent, which is used for cooling water in connection with condensers and for other purposes where cooled water is required. As stated above, however, such a pond is not efficient except in the winter months, hence, there is a long period, generally eight or nine months of the year, during which the temperature of the water to the condensers is much higher than it should be for economical operation, resulting in a loss in vacuum of 4 or 5 inches as an average, that is, during the winter a vacuum of 27 inches is obtained, which falls off 22 or 23 inches in the summer thus resulting in an increase

in cost of power amounting to from 5 per cent. to 12 per cent., or an average of 8 per cent. the year round.

The application of a spray-cooling system to one of these ponds is generally a very simple matter, consisting of an extention of the condenser discharge piping over the pond, supported on wooden bents or concrete piers, with a sufficient number of properly designed spray nozzles arranged at the right distance with relation to each other and the correct height above the surface of the pond so as to bring the sprayed water into contact with a sufficient amount of air to produce the necessary cooling effect. The pressure required at the nozzles is only from 5 to 7 pounds, and in many cases the condenser already in use is able to discharge the water against this pressure plus the pipe friction between the condenser and nozzles, provided the system is correctly designed. In case the condenser cannot do this, or is of the barometric type discharging the water into a hot well, then an auxilliary pump can be used to take the water from the hot well and deliver it to the spray system at the proper pressure. Such a pump is generally of the centrifugal type, either direct connected or belted to a motor or other prime mover, such as a small steam turbine, engine or counter-shaft.

Some mills of comparatively small capacity are now operated non-condensing, due to the lack of a sufficient supply of cool water for condensing operation. Many of these mills could install an

A TYPICAL SUMMER DAY.

A. M.	Temperature Air. Degrees of Fahrenheit.	Relative Humidity Per Cent	Temperature of Water Before Spraying. Degrees of Fahrenheit.	Temperature of Water After Spraying. Degrees of Fahrenheit.	Vacuum Obtained Inches Mercury	Average Barometer Inches Mercury.
7	69		104	87	27.9	
8	71	40	108	92	27.5	30.05
9	75		110	94	27.45	
10	78		112	96	27.25	
11	85		113	98	27.25	
11.45	88		114	98	27.10	
P. M.						
1.15	90		112	98	27.25	
2	92		113	96	27.25	
3	93		113	96	27.25	
4	93		113	97	27.20	
5	92		113	98	27.20	

TEXTILE MILL SPRAY POND.

A HOT SUMMER DAY

Hour.	Temperature Air. Degrees of Fahrenheit.	Relative Humidity Per Cent.	Temperature of Water Degrees of Fahrenheit. Hot.	Cooled
8 A. M.	90	70	108	90
12 M.	98		118	93
4 P. M.	102		118	93

SOUTHWESTERN POWER PLANT SPRAY POND.

A TYPICAL JULY DAY

Hour.	Temperature Air. Degreees of Fahrenheit.	Relative Humidity Per Cent.	Temperature of Water Degrees of Fahrenheit. Hot.	Cooled	Degrees Cooled Below Atmosphere.
8 A. M.	85	32	86	76	−9
12 M.	93	19	90	80	−13
4 P. M.	93	19	91	79	−14

earthen pond or a concrete basin with a spray system at a comparatively small expense and thus make a net saving in power cost of from 15 to 20 per cent.

Figures 1 and 2 show typical cooling ponds in operation in connection with textile mills, the former having a concrete basin and the latter a pond with earthen embankments lined with about 6 inches of puddled clay to make it practically water-tight. It will be noted from these illustrations that the nozzles are arranged in groups of five, each at regular intervals along the pipe lines extending over the pond, the distance between these pipe lines varying from 20 to 25 feet, according to the capacity of the nozzles used. At some point in the pond near the condenser a suction well is constructed, generally of concrete and provided with a double set of screens to prevent foreign matter, which may blow or fall into the pond, from clogging the condenser and nozzles. Arrangements are also provided for proper overflow and drain connections. If the space available is restricted and it is necessary to place one side of the pond nearer than 30 feet to buildings, a louvre fence is used to protect these buildings from drift in case of high winds. Louvre fences, however, are not necessary when the pond is 30 feet or more distant from buildings, as with this distance and the additional distance of 20 to 25 feet between the nozzles and the sides of the pond, very little spray is blown out of the pond even in case of high winds. The average loss from drift, as shown by careful tests lasting one week or more, show the total loss from evaporation and drift to average about 1 1/4 per cent. of the total water sprayed for installations in the New England States and not exceeding 2 per cent. for installations in the Southern States, the increase in the latter case being due to increased evaporation due to higher air temperatures.

A TYPICAL WINTER DAY.

A. M.	Temperature Air. Degrees of Fahrenheit.	Relative Humidity Per Cent.	Temperature of Water Before Spraying Degrees of Fahrenheit.	Temperature of Water After Spraying. Degrees of Fahrenheit.
7	16		90	57
8	18	72	100	60
9	20		104	63
10	22		105	64
11	24		107	65
11.45	26		108	66
P. M.				
1.15	28		108	64
2	30		110	66
3	31		110	66
4	30		110	67
5	28		112	67

A very low ratio of circulating water to condensed steam used in winter.

A TYPICAL SPRING DAY

A. M.	Temperature Air. Degrees of Fahrenheit.	Relative Humidity Per Cent.	Temperature of Water Before Spraying. Degrees of Fahrenheit.	Temperature of Water After Spraying. Degrees of Fahrenheit.	Vacuum Obtained. Inches Mercury.	Average Barometer Inches Mercury.
7	56		99	82	28.3	
8	59	79	100	85	28.3	30.35
9	62		101	86	28.2	
10	64		103	88	28.15	
11	66		104	88	28.15	
12	68		104	90	28.05	
P. M.						
1	70		104	87	28.	
2	72		104	88	28.05	
3	74		104	88	28.05	
4	73		104	88	28.05	
5	70		105	88	28.05	

Following is a description of the illustrations of spray cooling ponds contained in this paper with a brief statement in regard to any special features or adaptation to special conditions shown.

Figure 1 shows a typical spray cooling pond with concrete basin, having a capacity for cooling 3,000 gallons per minute so as to maintain an average of over 28 inches vacuum the year round referred to a 30 inch barometer. This is used in connection with a low pressure turbo-

generator which receives exhaust steam from two Corliss engines, both turbine and engines furnishing electric power for a large textile mill in the New England States.

Figure 2 shows a cooling pond in connection with a cotton mill in the Southern States where soil conditions were such that a water-tight pond could be constructed with a puddled clay bottom and side banks at a very small expense, thus avoiding the more expensive concrete construction.

FIG. 1

As will be noted, the pipe lines over the pond are suspended from wooden pile bents.

Figure 3 shows a spray system over a natural pond in the New England States, operating at only 3 pounds pressure during spring and fall, as sufficient cooling is obtained at this pressure, although 6 to 7 pounds pressure is required in the hottest days of summer.

Careful tests made by disinterested engineers, extending over a period of several weeks, have shown that the average amount of heat dissipated from the surface of a natural cooling pond with partitions similar to Figure 1 was 3.5 B. T. U.'s per square foot per hour per one degree difference, and that the average heat dissipated by a spray cooling pond was 127 B. T. U.'s per square foot per hour per one degree difference or approximately thirty-six times as much. This shows that a cooling pond without sprays capable of taking care of a 100 horse-power plant, can be

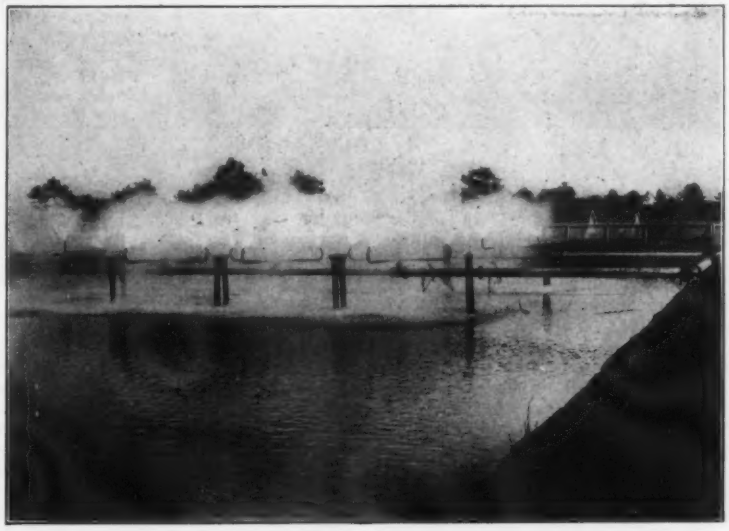

FIG. 2

increased in capacity to take care of a 3,600 horsepower plant by the addition of a spray cooling system.

With cooling ponds of any type the feed water for the boilers is not taken from the pond but from the pipe line between the condenser and the pond, thus saving the heat in that portion of the condensing water delivered back to the boilers.

It is important to have the ratio of condensing water to steam condensed large enough to keep the water in the pond in equilibrium for any desired vacuum, for if this ratio is such that the heating effect of the condenser is greater than the desired cooling effect of the pond, then the temperature of the pond will rise to a higher point and the vacuum will decrease a corresponding amount, thus impairing the economical operation of the engine or turbine, as the case may be.

With a spray cooling system when there is no breeze, an effective current of air is created in an upward direction around each nozzle, due to the movement of the spray as well as to the heating effect which the spray has on the air which comes in contact with the water, thus rapidly carrying away the warm moist air produced and replacing it with cool dry air brought in from all sides over the surface of the pond.

Spray cooling ponds are more efficient in extremely hot weather when high humidity prevails than in cool weather with low humidity.

Some results obtained with spray cooling systems follow:

Artificial pond in connection with cotton mill in New England States, having 4,000 horse power of Corliss engines. Pressure at nozzles, 6 pounds.

The last results are made possible on account of the low humidity.

All of the above results were obtained with single spraying, that is, spraying the discharge water only once before returning it to the condenser. Greatly increased cooling effects can be obtained by two or more separate and successive sprayings, or by multiple spraying, which consists of mixing a portion of the cooled water from the pond with the hot water in the discharge line and spraying the mixture at the resulting average temperature.

In order to determine whether the installation of a cooling system is warranted or not in any special case, it is only necessary to compare the cost of city water used for condensing purposes, or the cost of pumping, if water is obtained from a more or less distant river, pond or wells of any kind, with the fixed charges on the first cost of a cooling system, plus the costs of operation and maintenance.

As spray cooling systems under average conditions have lower first cost, require less power for operation and practically no maintenance as compared with well designed and constructed cooling towers, they are being used to a constantly increasing extent in connection with cotton mills, except in cases where sufficient pond area is not available either on the ground or on roofs of buildings adjacent to the condensing installation. This latter condition, however, rarely occurs in the case of cotton mills and their allied industries.

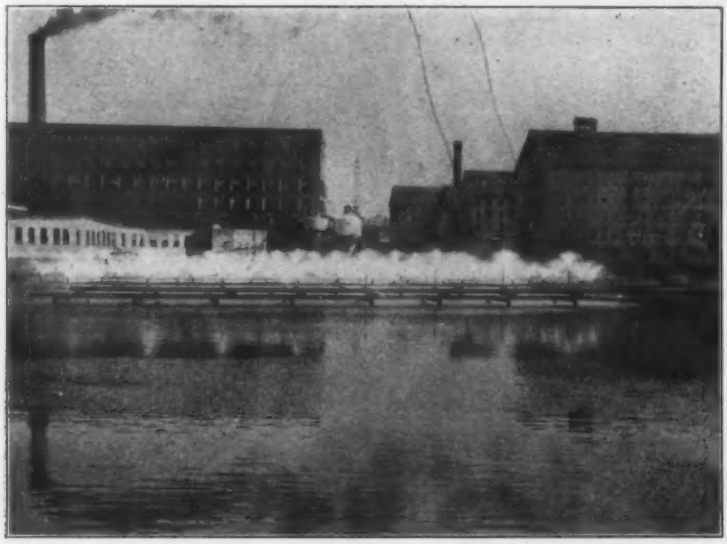

FIG. 3

In India the wages are 9 cents per 10 hours for women at the cotton gin and 12 cents per 10 hours for men for heavier work.

BALL BEARINGS FOR COTTON MILLS

Elliott A. Allen, Textile Department, The S. K. F. Ball Bearing Company, 50 Church St., New York City

In discussing the value of ball bearings for cotton mills, let us understand the construction of this type of bearing. In 1907, Mr. Sven Winquist, a resident of Gothenburg, Sweden, invented and marketed a ball bearing which, owing to its design, is peculiarly adapted to practically all types of machinery, in that it embodies features which are unique and quite distinct from any other ball

ELLIOTT A. ALLEN

bearing designs. This bearing is shown in Fig. 1. As will be seen from the illustration, the inner race of the ball bearing contains two grooves, each ground to a radius slightly larger than the radius of the balls. The outer race is ground in the form of a section of a hollow sphere whose center is the center of the axis of rotation. It should be noted that the two rows of balls and inner race are free to rotate at any angle within this spherical outer race without subjecting the races to any undue strains, allowing a perfect "ball and socket" action of self-aligning action.

The ease with which this bearing performs all its functions of light running under conditions of shaft mis-alignment, is appreciated when it is pointed out that the balls roll on the surface of the spherical outer race with a pure rolling motion. It is automatically self-aligning, therefore the balls are not subjected to undue loads or pinching. Also, the fact that two rows of balls are used in each bearing, means less load carried per ball, hence greater durability. The old trouble from cracked balls is entirely eliminated with this double row, self-aligning design.

These bearings are made of high grade, special analysis, Swedish steel, free from sulphur and phosphorus. Each ball is ground to practically perfect sphericity, the races and balls being polished to a mirror-like finish.

I—COTTON PICKERS AND OPENERS

The English were the first to apply these ball bearings to beater shafts. The prime considerations were first, power saving obtained, second, maintained durability of the ball bearing, third, cleanliness. These beater bearings have been installed extensively since 1907, and in no case has wear within the bearing been detected. Numerous tests on domestic made pickers, openers and finshers equipped with these ball bearings show an average saving of 3/4 horse power per beater—in all cases the power saving has been in excess of 1/2 horse power or over 10 per cent. of total power consumption. An extract of a letter from a cotton mill superintendent follows:

"The 26 ball bearings on our picker beaters have given us general satisfaction so far and caused no trouble. Our cotton pickers run night and day and run cool. They are all driven by individual motors, belt drive. The power average was 4.35 horse power per beater, which your bearings reduced to 3.56 horse power with beater speed maintained and regular. With this saving on 13 beaters of 10.27 horse power night and day, we cannot regret the investment I can assure you, and furthermore, the saving in oil, clean beater box sides and cool running are in themselves sufficient to recommend these ball bearings to the notice of practical cotton mill men who are looking for results."

For a practical example of the value of ball bearings to beaters, assume a power cost of $30.00 per horse power for a three thousand hour year, 3/4 horse power means a saving of $22.50 annually per beater or a return of 75 per cent. on the ball bearing investment.

The durability of these ball bearings means no repair trouble to boxes or the beater shafts, for the rubbing friction is eliminated. These ball bearing picker boxes (see cuts 5 and 8) are leak proof, therefore, the beater sides are clean and dry without their usual collection of oily fly. Most of the mills prefer to use grease for these ball bearing boxes, and only once a month is it necessary to add lubricant. For ten hours a day service, 10 lbs. of good neutral vaseline grease will supply one bearing of beater boxes for a year, which means much in saving of labor and up-keep costs.

One of the most important features of this ball bearing application to the mill superintendent is the ease with which the change can be made from

the plain beaters which are in use to the ball bearing type. No machine work whatsoever is required at the mill, unless the shaft has been worn badly. The ball bearing box is made to replace any type of plain bearing box, and the type of ball bearing furnished is adaptable to shaft sizes already in use. See Fig. 9. By slipping the tapered collar and ball bearing over the beater shaft to its desired position and tightening the lock nut, the entire ball bearing and collar is clamped to the shaft and rotates with it.

Ball bearings have also been used extensively on the fan shaft of pickers where the features have been, first, protection from abuse and intrusion of dirt; second, freedom from vibration of wear; third, infrequent attention and lubrication; fourth, slight power saving.

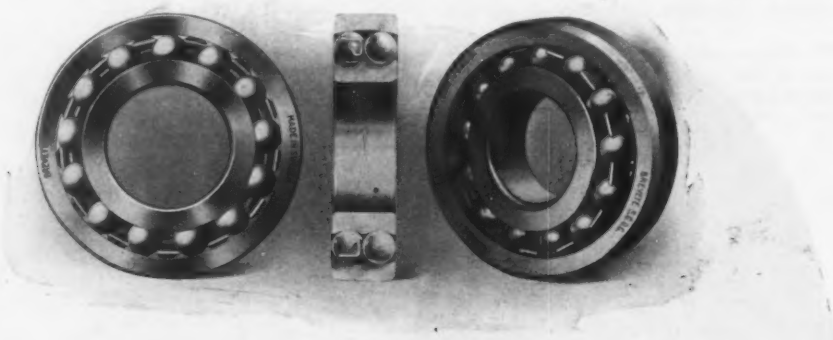

FIG. 1. RADIAL BALL BEARING, SHOWING AT THE LEFT THE BEARING IN NORMAL POSITION, SECTIONAL VIEW IN THE CENTER AND DEFLECTED POSITION AT THE RIGHT

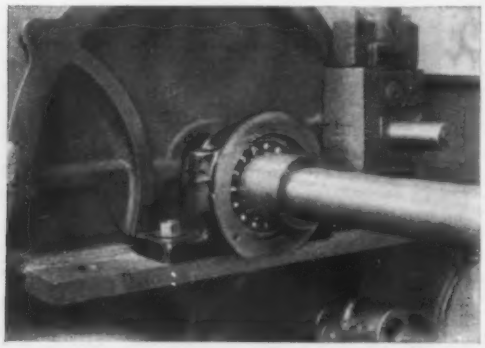

FIG. 5. BALL BEARING BEATER BOX

II—COTTON CARDS

The application of these ball bearings to the main cylinder of cards was first introduced by the German card builders, and there are a number of these ball bearing cards to be found in this country. The particular feature of absolute cleanliness in these boxes, which are very similar to the beater boxes, and the maintained accuracy of ball bearing, together with the ease of starting the card cylinder, has brought this application beyond the experimental stage.

III—ROVING FRAME TOP ROLLS

One of the earliest applications of ball bearings to cotton machinery, with ball bearing top rolls, was made by a New England man. This surely has been a successful application of ball bearings in their simplest form.

IV—SPINNING FRAMES

Again the English cotton machinery manufacturer has been the pioneer in developing ball bearing applications to the cylinder shafts on spinning and twisting frames. Figure 11 illustrates an English double cylinder frame with ball bearing boxes. This application has been regarded as one of the earliest in the cotton mill industry, and came out about the time of the first tape driven frame. The success of this ball bearing is obvious, for no matter how the band pull may vary, the almost frictionless operation of the ball bearing boxes remains constant. A set of tight bands will increase the power consumption about 15 per cent. with plain bearings and consequently slow down

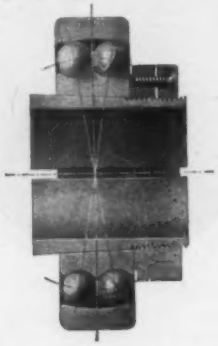

FIG. 9. ADAPTER TYPE OF BALL BEARING

the production. This is not possible with ball bearings. Further, the lubricant often becomes set or squeezed out of the plain cylinder bearings from the week-end shut down, and the starting load is often terrific, especially with tight driving belts and small pulleys. All this difficulty is easily overcome by the use of these ball bearings, for the amount of friction does not increase with the load or spindle band and driving belt pull.

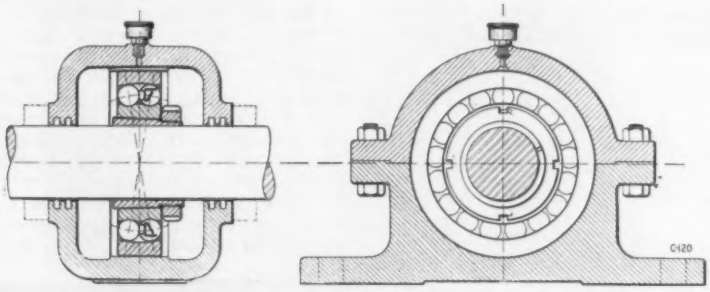

FIG 8 SECTIONAL VIEW OF BALL BEARING BEATER BOX FOR OPENERS, BREAKERS AND FINISHERS

Illustrations 12 and 13 show the mountings of these ball bearings, and the value of the self-aligning feature within this ball bearing should be particularly noted. This overcomes the necessity for trunnion or swivel boxes and their attendant nuisances. The box for the self-aligning ball bearing is bolted rigidly to the frame cross girts, and after once levelling, no further attention need be given, for the automatic aligning feature of the ball bearing serves its purpose. These boxes, like all ball bearing boxes, are leak proof, and consequently require very little lubricant—it is preferable to use grease forced in with grease guns once in two or three months, which means no dripping of oil on the cylinder frames or floor to collect dirty lint. Also, the coolness of these bearings help to maintain a very even temperatured spinning room, for under no abnormal conditions of load or speed will heat be generated by properly mounted ball bearings.

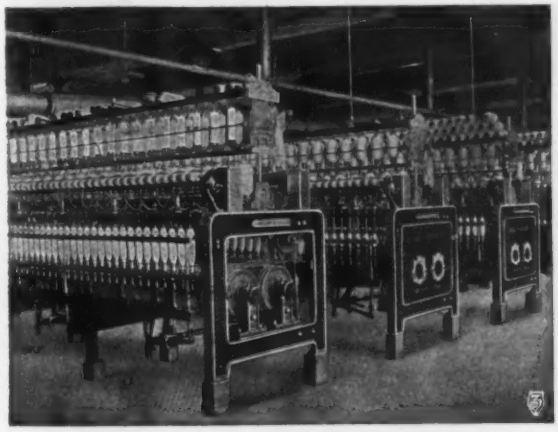

FIG. 11. BALL BEARINGS ON CYLINDERS OF AN ENGLISH FRAME

It is well known that belt slippage caused by oily fly and tight running cylinder bearings amounts to from 10 to 15 per cent., and even more in old mills with low head room with tight belts or small driving pulleys on the frame. The application of ball bearings to cylinder shafts eliminates practically all this slippage on account of the light running of the bearing. Therefore, if the belt slippage is reduced, higher speeds may be maintained and more uniform yarn produced by the constancy of the drive.

On tape driven frames, ball bearing cylinder shafts are of decided advantage because the tape pull is all on one side of the bearing; i. e., not equalized as on the band driven frames.

The following are extracts from tests on motor driven ring spinning frames. Each frame was identical, spinning the same yarn at the same time and with the power consumed by the driving motor itself deducted in all cases, giving exact net horse power required to drive the frame itself.

472 Spindles, 2-1/5 inch Gauge, No. 33's Yarn.

Cylinder Speed r. p. m.	Spindle Speed r. p. m.	Cylinder Bearings h. p.	Ball Bearings h. p.	Amount Power Saved
790	8,500	4.90	4.38	.52
870	9,300	7.17	6.24	.93
1,000	10,800	10.62	9.12	1.50

This shows savings varying from 10 per cent. to 15 per cent. of the net power and also proves that as the speeds are increased, so are the power savings.

The other test was as follows:

364 Spindles on No. 248 yarn

Motor Speed r.p.m.	Cylinder Speed r.p.m.	Spindle Speed r.p.m.	Power Consumed H. P.	No. of Spindles H. P.
		Cylinder — Plain Bearings:		
1,300	820	8,220	4.133	88
		Cylinder — Ball Bearings:		
1,320	840	8,380	3.906	93

which shows, by the use of ball bearings, an increase of spindle speed of 150 revolutions, or about 2 per cent. increase in production, and at the same time a power saving of .227 horse power, or 5 1/2 per cent. of total power. In this country various

tests have been made and the results have been practically the same as those above. One of the large spinning frame manufacturers in this country conducted a series of tests in their own experimental department and found a saving of about 50 per cent. of the power required to drive the cylinder bare, and no increase in power consumption on starting. That is, the starting effort was no greater than the power required after machine was in operation.

These ball bearings may easily be applied to machines already in service by means of the tapered sleeve, as shown by the illustration of the adapter type of bearing, shown in Fig. 9.

FIG. 16. BALL BEARING RING TWISTER SPINDLE

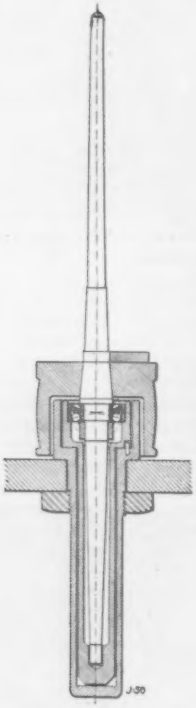

FIG. 17. SECTION THROUGH TWISTER SPINDLE

V—SPINDLES

"Nothing new under the sun," is well illustrated by ball bearings for spindles. Few realize the trials that have been made to perfect a practical and absolutely dependable ball bearing spindle. Many attempts have failed, and only within the past few years has a successful ball bearing spindle been developed. The heaviest types of spindles lend themselves most easily to the application of the modern ball bearings, and some eight years ago, English heavy flyer spindles were so equipped. These ball bearings were used in the upper rail of the fly frame and acted as a step bearing as well as radial, although the bottom rail chiefly was retained to steady the spindle.

In this country there has been an interesting development of heavy twister spindles. A well known mill producing tire duck, has had in constant operation for a period equivalent to more than five years, ball bearing twister spindles as shown by Figs. 16 and 17. Not one adjustment or replacement has ever been made in this application, which proves the reliability of this type of ball bearing spindle. These spindles were carefully examined recently and it is reported that the wear on the ball barings is practically nil. From these indications, it would appear that the life of this type of heavy twisted spindle would not be less than twenty years. These are 132 spindle frames running 23 ends of No. 19-ply at 2700 revolutions with 4 1/2 inch rings and operate practically twenty-three hours a day, making tire duck yarn. They are belt driven and comparative tests show a net saving of 1.1 horse power per frame with ball bearing spindles. This power saving figured at $25 per horse power 3,000 hours per year nets a saving of a 6,000 hour year of $55 per frame annually to the mill, besides producing a more uniform yarn on account of the light running of the spindles.

FIG. 18. 132-SPINDLE FRAME WITH BALL BEARING TWISTER

In other words, the initial cost of ball bearing spindles will be returned inside of two and one-half years of operation, or five years of ten hour day service. Under ordinary service, the investment in ball bearing spindles yields 20 per cent. profit and practically no repairs during the life of the ball bearing, which is conservatively estimated at twenty years.

A mechanically durable and commercially practical ball bearing spindle, demands: first, proper type ball bearing; second, simplicity of construction; third, oil retaining features; fourth, disassembling or cleaning features. The ball bearing must be accurately made to withstand the wear of high spindle speeds. It must contain small-sized balls to reduce centrifugal action and subsequent wear, and it must be self-aligning to permit of proper spindle play. The ball bearing, however, cannot be loose within itself, as its vibration would destroy the spinning properties of the spindle, but the ball bearing must nevertheless permit the spindle to be loose or free without causing binding or jamming of the balls. The illustrations show

the design of two types of successful ball bearing spindles. A very important feature is the position of the ball bearing relative to the whorl. Notice that the ball bearing is placed very close to the center line of the whorl, which tends to balance the pull and relieve the step bearing of practically all side strain. This means that the spindle blade should with proper care of lubrication and cleaning, last indefinitely, as the ball bearing can be replaced if necessary without harming any part of the complete spindle.

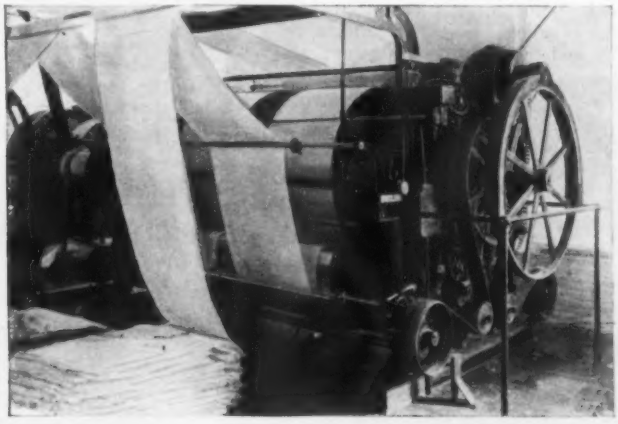

FIG. 22. A BALL BEARING NAPIER MACHINE, MOTOR DRIVEN

Ball bearing spindles must be oiled regularly with the very lightest grade of good machine oil, and the amount of oil used is about one-half that used on plain bearing spindles. These ball bearing spindles can be taken out of the bolster and base for inspection and cleaning in the same manner as plain bearing spindles. This is a feature worthy of note.

ADVANTAGES OF BALL BEARING SPINDLES

Ball bearing equipped spindles, because of their easy driving, have a tendency to produce yarn of uniform and full theoretical twist. Because of this fact, in many cases the twist may be less than that required by plain bearing spindles.

The difference in band tension has less effect on the speed of ball bearing spindles, therefore, a uniformity of yarn can be expected from bobbins taken from newly banded frames as well as those that have been used for a considerable length of time. The light running of the ball bearing spindle is maintained over a wide range of band tension, because the coefficient of friction of ball bearings

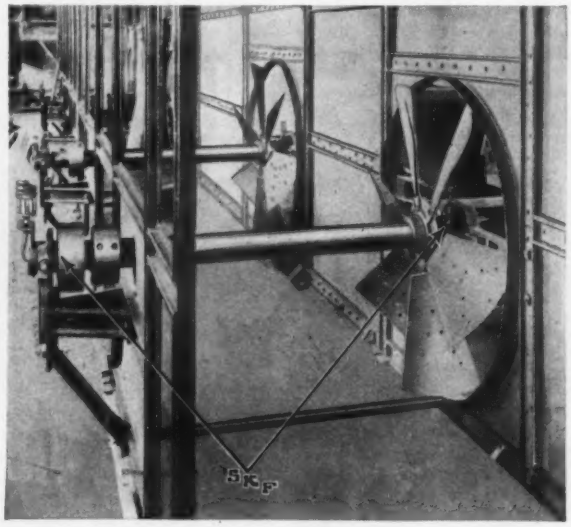

FIG. 26. BALL BEARING AIR CIRCULATING FAN FOR DRYERS

is practically the same under all loads. This means that all band driven frames may be brought to modern efficiency and to compete successfully with new tape driven frames by the use of these ball bearing spindles. Also, because of the reduced slippage of belts and bands, higher spindle speed may be obtained, giving greater production, less breakage, stronger and more uniform yarn.

Lastly, and of prime importance, is the power saving of ball bearing spindles. Tests have been made on spindles only and records of 30 to 33 per

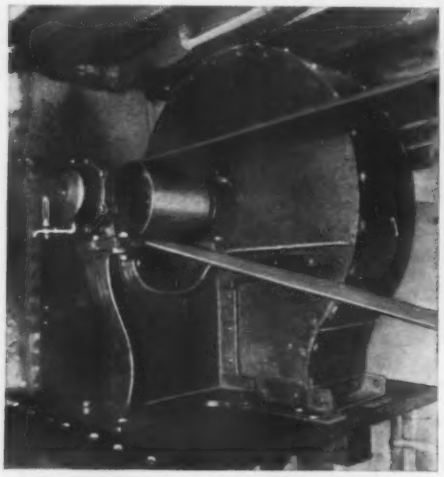

FIG. 29. EXHAUST FAN INSTALLED IN JUTE MILL

cent. power saving are shown. Under operating conditions in the mill, these savings are reduced 12 to 18 per cent. because of the frictional losses through the entire frame. Also spinning and twisting conditions vary so widely, due to traveler weight, top roll weight, speed, twist, etc., that power savings from ball bearing spindles will also vary; but a conservative estimate would be 15 per cent. of the total power. For example, take 4 3/4 horse power per frame of 256 spindles and in a 10,000 spindle mill, the annual power bill would be 190 horse power x $30.00 per horse power per year or $5.700.00. A 15 per cent. power saving nets $855.00 annually. Power is money and it pays to save power.

VI—NAPPERS

Probably one of the earliest and most extensive applications of the modern ball bearing to textile machinery was made by the German napper builders some eight or more years ago. The severe service of the worker rolls produce journal friction, which consumed an excessive amount of power and destroyed the plain bearings. These rolls operating at high speeds, on account of their length, are subject to "whip" or "ballooning," which makes use of self aligning bearings imperative. The severely tight belts used on these workers create a high bearing load, which feature favors the use of ball bearings.

On a 36 roll, 80-inch napper, 8-inch belts are used and 3 1/4 horse power is required to drive these rolls alone, and about 5 3/4 horse power when the complete napper is in operation. Formerly, with plain bearing worker rolls, over 8 horse power was consumed, thus showing a saving of approximately 30 per cent. in favor of ball bearings. It may be interesting to note that up to within a year ago 40,000 of these ball bearings were used annually on worker rolls on nappers throughout the world (this embraces both cotton and woolen nappers).

ELECTRIC MOTORS

The use of ball bearing for electric motors is proving to be an ever growing application for the reason that the requirements in textile mills are

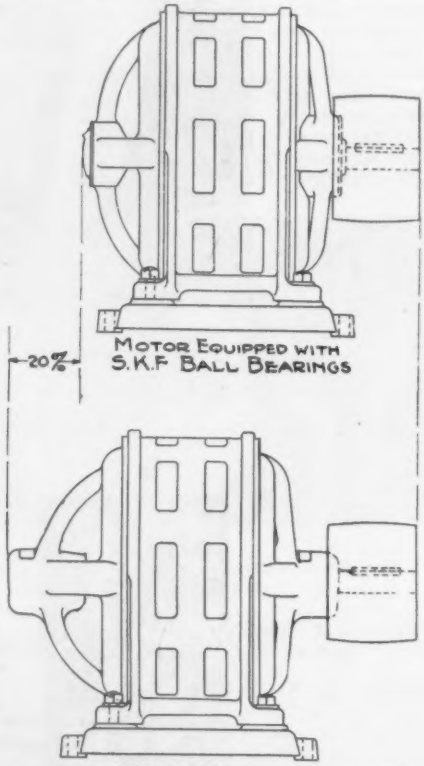

FIG. 34. COMPARISON OF MOTOR LENGTHS

such that ball bearings seem especially adapted for this service. There is always danger from fire in textile mills where there is frequently an accumulation of oil-soaked lint around a leaky bearing, and added to this is a possibility of ruining fabrics from dripping oil. In the individual ceiling motor drive or the four frame drive where direct connected motors are employed, the possibilities of dripping oil are a constant menace unless the bearings can be sealed against leakage. As will be seen from Fig. 32, the ball bearings are contained in compact housings which are sealed on either side by close fitting bearing caps. These caps form liberal lubricant chambers around the ball bearings. The bearings are positive self lubricators without any auxiliary oiling devices, and the

close fitting caps next to the shaft insure the retention of the lubricant and therefore the prevention of oil leakage along the shaft.

Further than this, the elimination of wearing parts in the motor, the freedom from rotating oil rings or chains in the bearing heads and the compactness of the bearing head construction due to the short length of the bearings along the shafts (see Fig. 34) secure for the motor user a construction which is as simple as it is rugged and as thoroughly proof against abuse as any type of design yet devised.

HANGERS

The cost of power to make a textile product is usually 10 per cent. of the selling price. A saving

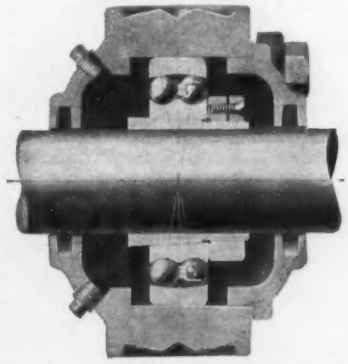

FIG. 36. SECTIONAL VIEW OF HANGER BOX MOUNTED ON SHAFT

of 25 per cent. by the use of ball bearing transmissions (which saving has been exceeded in many instances) will reduce the production 2 1/2 per cent., including the interest on the ball bearing investment. A reduction of 2 1/2 per cent. in the manufacturing cost is a matter worthy of careful consideration and points the way towards future reductions in selling price.

In March, 1914, a paper presented before the American Society of Mechanical Engineers showed by comparative tests the following relative amounts of power consumed in friction in three types of hangers.

Relative Amounts of Power Consumed in Friction

100 Ft. per min.	77 deg.	100 deg.
Ball Bearing Hanger	1	1
Roller Bearing Hanger	2.2	2.5
Babbitt Bearing Hanger	3	3.6
300 Ft. per min.	77 deg.	100 deg.
Ball Bearing Hanger	1	1
Roller Bearing Hanger	2.7	3
Babbitt Bearing Hanger	4.5	4

This table shows the relative amounts of power consumed in friction by the three kinds of bearings at the speeds and temperatures indicated.

From elaborate tests made on long lines of shafting mounted, first in ring-oiled babbitt bearings and second in self-aligning ball bearings, readings were taken of the power consumed by the bearings and the power saving amounted to considerable. In the case of the substitution of ball bearings on shafts running at 200 revolutions per minute, under an average load of 395 pounds per bearing, the power saving on curve "D" is equal to 48 per cent. This 48 per cent. is the reduction in the power consumed by a bearing of the ordinary sleeve type.

It is a well known fact that many English cotton mills use complete equipments of ball bearing hangers, and the number of New England cotton mills following this example is increasing. Because of the lubricant saving, cleanliness and reduced fire hazard, they commend themselves to the mill superintendent. The ball bearing for these hangers is readily understood by referring to Fig. 36. An adapter bearing is used to grip the bearing securely to the shaft and it should be noted that no rotating bearing parts touch the shaft. The casing surrounding the bearing has but one removal cover with plugs on top and bottom for refilling and draining of the large lubricant chamber. Provision against leakage of the lubricant and intrusion of dirt is effected by a groove and felt washer on each side of the bearing.

From over 500 installations operating in this country at the present time, the following figures might be taken as representing average conditions.

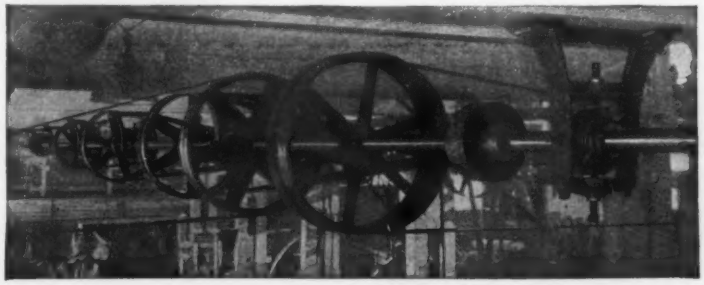

FIG. 37. TYPICAL INSTALLATION OF BALL BEARING HANGERS

Total number of hangers	110
Frictional loss due to plain bearings, h. p.	43
Cost of electric current per k. w. hr.	$.01½
Cost to operate plant for 50 week year with plain bearing hangers	4,203.75
Savings secured by using ball bearing hangers, h. p.	25

Cost to operate plant for 50-week year, with ball bearing hangers	3,363.00
Power saving through the use of ball bearing hangers	840.75
Total cost of installation including hangers and erecting	1,208.00
Interest on investment at 6 per cent.	72.48
Depreciation, estimating 4 per cent.	48.72
Total cost first year	1,329.20

FIG. 38. BALL BEARING HANGERS USED IN DRIVING KNITTING MACHINES, 54 KNITTERS ARE RUN BY A 5 HORSE POWER MOTOR

Saving in maintenance	61.75
Saving in lubricant	64.00
Total saving through the use of ball bearing hangers	966.00
Total cost first year	1,329.20
Total saving first year	966.50
Time required for the investment to pay for itself, 16 months, or about 75% return on the investment.	

On the question of life of these bearings for hanger use and how long they will operate, a definite answer cannot be given beyond stating that they have been used for this work for over eight years and if appearances count for anything, after an examination of the bearings it would appear that they were good for at least seven of eight years more.

Ball bearing hangers are more than power savers. They are power producers and a most effectual means of reducing equipment costs. They save in power, maintenance, lubrication and equipment.

THE DEVELOPMENT OF THE USE OF NATURAL DYESTUFFS

Edward S. Chapin, 516 Atlantic Ave., Boston, Mass.

"Once in ten years," remarked the head of a prominent bureau of American research, "Once in ten years is often enough to make a report on a research."

Four months ago, at the spring meeting of this Association, it was my privilege and pleasure to present a paper on the Revival of the Use of Natural Dyestuffs. According to the rule of the professor of research, the few intervening months since then constitute a period that could not deserve reporting. The development of the use of natural dyestuffs in the past four months has been so notable, however, as to warrant more than a passing comment at this fall meeting of The National Association of Cotton Manufacturers.

A new viewpoint is making possible the rapid development of the use of natural dyestuffs. It is the testimony of concerns employing dyers familiar with the use of natural dyestuffs that many of their best sellers are being produced with the use of natural dyestuffs, by a different method of dyeing, to be sure, than formerly, but the results are being produced. Other concerns who had given up the use of natural dyestuffs for one reason or another, some sufficient, others insufficient, in the light of reason—have perforce received instruction in the use of natural dyestuffs and have found results much better than expected.

EDWARD S. CHAPIN

It is interesting and significant to note at this point that, prior to the present development, natural dyestuffs were preferred and used for many purposes, with a free choice to use artificial colors.

The advantages which caused many thoughtful buyers of colors to prefer, for certain purposes, natural dyestuffs ,are now becoming evident to those who had not found out or believed in these advantages prior to the European war.

The realization of these facts are giving many men and commission houses increasing confidence in the possibilities of the development of the use of natural dyestuffs.

The situation is complicated. There are nine separate natural dyestuffs that are available in large quantities. Where these should rightly be used in preference to artificial colors, they are

coming into their own, performing their appropriate services; and happiness reigns. These same nine dyestuffs are also asked to perform the function properly belonging to specialized artificial products. There are nine hundred separate artificial dyestuffs, that are dropping out one by one; and the nine are now asked to take on all the duties of the nine hundred!

Sensing the situation, a very good dyer friend of mine, who is accustomed to expressing his thoughts with pungency, completed a request to help him to a new position with the words, "And I don't want no God Almighty job either." A little more startled than usual, I replied, "Why, what do you mean?" "Oh, this; I can do the possible; but by a God Almighty job I mean doing the impossible, and I can't do that."

The impossible—that which seemed impossible not many months ago, is being accomplished with the use of natural dyestuffs: to this, the words of disinterested and competent parties, bear witness. "They tell me," said a friend, walking into my office, "that these"—indicating a bright green and a bright red dyeing on wool he held in his hand—"were colored with the use of natural dyes." This friend, at present the manager of an important American chemical works, was formerly associated with me in research work on natural dyestuffs for the American Dyewood Company, and had been visiting our former associates. "A bright green and a bright red on wood from natural dyestuffs! I would not have believed it possible." "How about these results on cotton from natural dyestuffs?" I replied, showing him dyeings, improvements over the various colorings exhibited at the spring meeting of the Association. "Even more astonishing," was the rejoinder; and he left my office marvelling at these developments in the use of natural dyestuffs.

To chronicle all the developments of the past months in the use of natural dyestuffs, is outside the province of this paper. Developments have gone far beyond the prophecies I made in my paper last spring. In some instances, difficulties on difficulties, like the soldiers from the dragon's teeth, have sprung up, a fresh troop after each obstacle overcome.

With the complete cessation of imports of artificial colors from Germany, and the effectual limitation of Swiss production, the cotton manufacturers and the people of this nation face a grave crisis. The utmost of sympathy and cooperation on the part of the purchasing public and the manufacturers alone can meet the crisis. Irresponsible statements, empty and delusive, such as, "The natural dyetuffs are just as good in every respect as the artificial dyestuffs, and better:" "This country can get along as it is without any outside help," must cease. It is time to see, eye to eye, to take careful account of our available means, and to plan for the future scientifically and wisely.

There must be a titanic pulling and a herculean pushing; the manufacturers must push forward, and the people of the country must aid them. As when one climbs a difficult mountain, a fiend of a Matterhorn, so all energies and helpfulness are required to scale the almost impassable cliffs, and to reach the goal.

The development of the use of natural dyestuffs to all the new and varied purposes now being exacted, will not come without two very definite helps.

First, the people of this nation, mill men, commission houses, merchants, and purchasing public, must gird on patience,—not a momentary sufferance, an atom of tolerance, but the bona fide enduring helpful steadfastness, which accomplishes results. Titanic feats are not wrought in a minute. John does not grow from infancy to full manhood in a day; evil for him if he did.

Second, the nation must make up its mind to research; research—that powerful giant that toils night and day incessantly, year in and year out, and makes, as it were, something out of nothing. True it is, that in many fields of chemistry and manufacturing, American research chemists, backed by far-sighted business men, have achieved most remarkable results; in the field that we are considering much progress has been made; but never has there been in this field the incentive, the unparalleled need for research like today. The developments of the use of natural dyestuffs in the past months show that it is possible to keep the mills of the nation in operation without the artificial colors. In many instances the results could hardly be improved upon; in many others, it remains to produce the best, the finest, the fastest, and the most economical results; and this means research, busy research.

If the present rate of development in the use of natural dyestuffs be properly accelerated, in another year there cannot fail to be much of great interest and value to compile and report for your meeting and Transactions, in spite of the statement of the leading authority on research in this country that once in ten years is often enough to report research. If it be your mind and the situation warrants, I shall be pleased to prepare a paper giving definite formulas, and illustrate it with dyed results at the one-hundredth meeting of this Association to be held next April.

THE SOUTHERN TEXTILE EXPOSITION

The committee in charge of the Southern Textile Exposition to be held in Greenville November 2 to 6 inclusive, is now making final plans for the assignment of floor space and other details. The Convention of the Southern Textile Association will meet at Greenville on November 5 and 6 during the progress of the Exposition. Greenville is in the center of the Southern textile industry, there being 2,500,000 spindles within a radius of 40 miles of Greenville, 7,000,000 spindles within 100 miles and 9,600,000 spindles within 240 miles. A large proportion of those in attendance will be practical mill men and the committee expects to have an extensive exhibition of specialties, novel-

ties and new devices pertaining to the textile industry. Those desiring to secure space should address the Machinery and Supply Committee, Greenville, S. C., stating the number of square feet needed.

DYEING-TRADE SITUATION IN BRADFORD

Consul Augustus E. Ingram, Bradford, Eng.

The dyeware situation in England appears still to be very difficult, and a perfect solution of the difficulties has not yet been found. The directors of British Dyes, Ltd., are reported to be inquiring for a suitable site for works at Selby, Yorkshire, but considerable time must necessarily elapse before any such works can be established and placed in operation. Moreover, progress is likely to be slow owing to the shortage of labor and to the fact that certain intermediate products from which a large range of aniline dyes are derived are needed for the manufacture of explosives. Much is being done to relieve the situation by having recourse to natural dyestuffs, but a great variety of fancy shades in anilines can not now be executed.

The Bradford Dyers' Association has recently issued a notice to its customers stating that, owing to the present condition of the color supply, the acceptance by them of dyeing orders, whether forming part of a contract or otherwise, and the receipt and holding by them of the relative goods does not necessarily imply ability on their part to dye them. It is entirely dependent upon their having the requisite materials available when the goods are ready for the dyeing process. Delivery may consequently be subject to delay or may even become impossible, whether the goods be in the prepared state or in the gray. Moreover, they state that their dyes are for the present entirely without guaranty for defects, either apparent or latent. Goods sent them for dyeing are accepted only on the understanding of the above position.

In regard to cotton italians, linings, venetians, and gabardines they state that as the supply of dye wares ordinarily used for such goods has practically come to an end they are unable to accept any more dyeing orders except for a more expensive and less controllable process. The price is advanced 2 to 4 cents per yard, subject to usual war advances. They add that the number of shades by this process will be limited and considerable allowance must be made for variation in matching and evenness of color. In regard to orders on hand, the goods will not be subject to the above advance in price, but in all probability allowance must be made for limited range of shades and variation in matching, etc.

Practically the same announcement is made by them in regard to all cotton cashmeres, coatings, moreens, poplins, and automobile cloths, venetians, tientsin twills and jeans, except that the advances in price do not apply to blacks, whites, creams, buffs, ecrus, or doves.

In regard to the shortage of labor, arrangements have been made between the Bradford Dyers' Association and the trade union representatives of the employees. After several conferences it has been agreed that men shall be temporarily transferred from establishments where work is slack to form a relief staff at other branches, and thus bring about more economy of operation. It is probable, therefore, that later on some branches of the association may be closed down, owing to this shortage of colors and labor.

SEYDEL MFG. CO. TO MAKE ANILINE OIL

The Seydel Mfg. Co. of Jersey City have begun the manufacture of aniline oil and will be ready to make delivery of considerable quantities about November 1st.

The Seydel Mfg. Company is managed by its president, Hermann Seydel, who is a graduate of the Krefeld School of Technology, having made a specialty of the study of dyestuffs.

Mr. Seydel is well known in the dyestuff business through his former connections with Kalle & Company and the Berlin Aniline Works.

The manufacturing end is under the direct supervision of Paul Seydel, who graduated as Doctor of Science at the University of Brussels, Belgium.

Intimate knowledge of the requirements

of the textile industry, as well as familiarity with the processes of manufacture, promise immediate success to this new enterprise and it is expected that the Seydel Mfg. Company may in the near future still further enlarge the scope of its manufacture.

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A PROCESS FOR TREATING OPEN-MESH FABRICS

A French process for treating open mesh fabrics has recently been patented in the United States and is described by the inventor as follows: The process consists in waterproofing and sizing tulles, nets and other textile fabrics of the open mesh type. The fabric is treated with a solution of nitrocellulose in a solvent containing sufficient amyl acetate to retard the drying. Open mesh fabrics, such as tulles, nets, and the like, are used in large quantities by modistes and milliners for trimming and decorating women's apparel, being made up, for example, in the form of bows, pompons, ruchings, etc., for dresses and hats. Sometimes entire hats are made from such fabrics. It is of the utmost importance, therefore, that the goods thus made up shall retain the shape given them, the artistic effect and stylish appearance of such decorations being due largely to the skill of the modiste or milliner in producing the particular design of trimming in question. Fabrics of this kind have in themselves little or no body or shape-retaining properties, owing chiefly to the fact that they are of such open texture and are composed usually of rather fine threads. It is therefore necessary to stiffen these fabrics in some way, as by sizing, in order to give the forms into which they are shaped even a moderate degree of permanence. Simple sizing is at best a makeshift since these fabrics are very sensitive to moisture and readily soften and lose shape in humid atmosphere.

Attempts have been made to stiffen and render waterproof open mesh fabrics of the type here in question by applying various solutions containing waterproofing agents. These attempts have not been wholly satisfactory, however, the protective coating thus placed on the threads being invariably more or less brittle and non-adherent, and also rendering the fabric too heavy and stiff. Too much stiffening is as undesirable as too little. The peculiar characteristics of tulles, nets, etc., which sharply distinguish them from ordinary fabrics, have rendered their successful treatment a difficult problem.

The unsatisfactory results obtained in attempting to waterproof open-mesh fabrics have been due for the most part to improper methods of applying the waterproofing agents to the goods. The solvents employed in the solutions were allowed to dry too rapidly after application, with the result either that there was insufficient impregnation of the threads to afford good anchorage for the coating left after evaporation, or else that too thick a coating was left. In the first case, the coating was brittle and non-adherent to such an extent that it scaled off and soon ceased to protect the goods; while in the second case, not only did the goods lose their delicate sheerness by over-weighting and over-stiffening, but their texture was apt to be more or less distorted and warped by the shrinkage of the excessively thick layers of waterproofing materials upon rapidly drying.

According to the process of the present invention, the difficulties above pointed out are avoided and new advantages gained. Permanently waterproof tulle and the like are obtained having just the desired amount of stiffness and possessing particularly fine luster and feel. Open mesh fabrics treated by the new method do not soften when exposed to moisture and always retain the shape given them.

The new process consists in applying to fabrics of the class described a liquid composition comprising a cellulose ester, such as a nitrocellulose, dissolved in a suitable solvent, and in retarding the evaporation of the solvent after application of the composition, by using in the composition an evaporation retarder which is itself advantageously a solvent of the ester or mixture of esters employed. The nitrocellulose may be in the form of collodion, gun cotton, celluloid, or derivatives of any of these, dissolved in any of their usual solvents such as alcohol and ether, or the like. To a solution of any of these is added amyl acetate in proportions

varying with the nature of the particular fabric to be treated.

The amyl acetate, by reason of its higher boiling point and slower rate of evaporation, serves to retard the evaporation of the other and more volatile solvents mentioned, thus permitting thorough permeation of the fabric threads by the liquid composition and enabling the formation of a very thin protective sheath or envelop of waterproofing agent incasing each thread and firmly locked thereto. The amount of amyl acetate used depends upon the degree of retardation desired in a given instance. It is very advantageous also to incorporate such a material as gum lac in the liquid coating composition, since the toughness and adherence of the final dried coating are in this way enhanced. The fabrics may be easily impregnated with the mixture in any suitable way, as for example by means of apparatus commonly used in dressing fabrics.

GERMANS FIND SUBSTITUTE FOR JUTE AND HEMP

Consul Harry G. Seltzer, Breslau, July 28

In view of the scarcity of jute and hemp for industrial purposes, manufacturers have been directing their investigations along various lines in an effort to discover, if possible, some practical substitute for these fibers. That they have been successful in this endeavor would appear from a report of the recent meeting of the Union of German Jute Manufacturers, in which various samples of fibers from a German plant (Epilobium hirsutum) were submitted.

This discovery was partly due to an accident in which it was explained that a man had used this plant as a roof covering for a cart house some years ago. Recently in removing this old roof he found that a certain rough hair-like fiber could be peeled off of the stems or reeds. After a number of experiments with a quantity of these fibers it was further discovered that on account of their age and the effects of the weather they were too brittle for practical purposes, so several plants of this year's growth were tried, with the result that another useful and practical textile fiber has been discovered.

Further investigations were made with other species of the Epilobium family, and it was found that all of them contained a fiber similar to hemp. The best results were obtained from the rough-haired willow rose (Epilobium hirsutus), followed by the narrow-leaved species (Epilobium angustifolium). All of these grow wild and in great abundance in Germany. The two species just mentioned have stems about 5 feet in length, require no particular soil, and produce a fine fiber. It is believed that by attentive cultivation a fiber as valuable as jute may be obtained.

There are sufficient quantities of these plants in Germany to supply the jute manufacturers with fibers for a year, and the only question which confronts the manufacturers is that of gathering in the crop. For this purpose the school children will be employed during vacation. Government officials have promised to aid in the systematic organization of these young harvesters, and the Union of Manufacturers will give every encouragement to the further cultivation of this plant.

Charles Richards Dodge, the well-known expert on fibers, comments as follows on the above report:

Perhaps this is a case where half a loaf is better than no bread. The species E. Angustifolium is common all over the United States and known as "fireweed" or "willow herb," a herbaceous plant 2 to 7 feet high, which springs up on cleared land, but which has never been regarded as a substitute for hemp. Judging from the samples the writer has seen, it is a rather poor substitute for commercial jute. The Indians of the Northwest have made use of the bast for cordage for many years, the fiber being rudely prepared, and when stripped in a green state shows good strength. As to the use of the fiber in Germany, the difficulty of harvesting and preparing it from wild growth will prove the chief drawback to the success of the enterprise. The seed of hemp, flax, jute and other bast fibers, to yield proper fiber, must be sown thickly in order to produce straight, clean stalks from which the fibrous portion of the bark can be economically extracted. To extract the bark from a mass of branching weed growth would seem to be rather a costly undertaking, even if gathered by patriotic school children.

The fruit of the plant is a pod-like vessel filled with cottony seeds. In 1863, during the American Civil war, the Flax and Hemp Commission, at Washington, received from Utica, N. Y., samples of "silk cotton," which had been extracted from the seed pods of Epilobium, together with home-made samples of "thread," rope and "cotton batting." The exhibit was more curious than useful. In Spon's Encyclopedia reference is made to the use of the cotton-like substance contained in the seed pods, but the use of the bast is not mentioned.

Correspondence and Notes

UPON TEXTILE TOPICS AT HOME AND ABROAD

FRENCH LAW ON UNFAIR COMPETITION

A Report by DeWitt C. Poole, Jr., Deputy Consul General at Paris, made at the request of the Textile World Record

The law of France affords far-reaching protection against unfair competition, although, in contrast to Germany there is no special enactment on the subject. The protection is found in a number of statutes which touch the question incidentally and in an extensive body of common law doctrine which has been developed under a section of the civil code, which reads as follows:

Every act of man which causes harm to another obliges him by whose fault it has come about to repair the harm.

The constitution of 1791 established absolute liberty of commerce. This liberty may be restricted only by contracts voluntarily entered into or by considerations of public order or good morals. Competition is an economic necessity. A manufacturer or a merchant may not prevent another from maintaining near him an establishment of an industrial or commercial nature similar to or identical with his own, provided the competition set up is honest and fair. A merchant or industrial, believing himself the victim of unfair competition, has recourse at law.

Each case of alleged unfair competition must be decided on its own merits, for courts in France are not controlled by precedents and the question whether or not one be guilty of unfair competition in a particular instance is a question of fact rather than of law. Nevertheless, a considerable body of doctrine has been developed, the outlines of which are revealed by leading cases. An insurance company known as "La Nationale" obtained judgment on the ground of unfair competition against a rival concern which assumed the designation "Societe Nationale". An office styling itself "Contentieux Europeen" obtained the suppression of the "Grand Contentieux Europeen".

A number of decisions have laid down the principle that a merchant may not supply similar but other goods in the place of those of specific mark demanded by a customer without informing the customer of the substitution. A merchant who substituted "Creme de Beaute Paul Simon" for "Creme Simon" was found guilty of a quasi-delict and held liable for civil damages to the manufacturer whose product had not been sold. The court of Paris on June 8, 1904, and the court of Aix on November 19, 1904, gave similar judgments in favor of the owners of "Quinquina Dubonnet," and the court of cassation for "L'Amer Picon" on November 18, 1902.

Competition which resorts to similitude in wrapping, labels, etc., is unfair. The court of Aix gave judgment on April 10, 1885, against a manufacturer who placed his product in containers of an unusual form already adopted by a competitor for the same article. A manufacturer of soap who labeled his product with a large star encircled by smaller stars was successfully attacked by a competitor who had placed a similar article on the market under the designation "Savon de l'Etoile," that is, "Star Soap".

Everyone has a right to his proper name and may use it for purposes of commerce, but if the use impinge on the rights of others the courts may impose limitations. In case where it is established that a person has been taken into a company because of his name and that his name is used in the company style as a measure of competition against an individual or firm of similar name, the courts have uniformly ordered that the style must be altered by the suppression of the name so as to obviate possible confusion. Where it is proved that the name was adopted with clear intent to defraud, judgment has been severe. Leading cases on this point relate to the champagne "Roederer-Heidsieck" and Meunier chocolate. Other well known trade names which have been successfully

defended against this form of unfair competition are Cliquot, Fine Martel and Veuve Pommery et fils.

A law of April 30, 1886, makes the unwarranted use of medals and industrial awards an offense punishable with a fine of from 50 to 6,000 francs ($10 to $1,200) and imprisonment of from three months to two years. The only effect of the statute is to create a criminal liability. A civil action would lie at common law in any case. A corporation styled Fermiere de Vichy has the sole right in France to print on its labels and advertising circulars the phrase "Controle de l'Etat," that is, "State Control". It obtained judgment on the ground of unfair competition against another dealer in mineral water who placed on his labels the phrase "Controlee par l'Etat," that is, "Controlled by the State".

With reference to advertisements a commentator remarks that it suffices to establish an act of unfair competition if a prospectus is worded or arranged so as to create confusion between two merchants, or between two products or between two industrial establishments. The disparagement of competitors is unfair competition. Judgment was obtained against an electric lighting company which refused to supply current to persons using a certain meter made by a rival company and which disparaged the objectionable meter verbally and in writing. The manager of a newspaper who published comparative tables showing the volume of sales of his paper and of a rival sheet so as to bring out the inferior circulation of the latter was adjudged guilty of unfair competition.

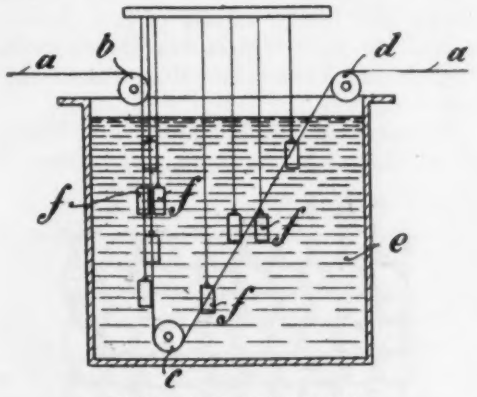
A manufacturer is guilty of unfair competition who entices or attempts to entice away the employes of his competitor with a view to ascertaining through them the latter's secrets of manufacture. It is unfair competition to start or circulate untrue reports tending to injure the business and credit of a competitor. An action alleging unfair competition is one at common law and does not take any particular form. The end sought is damages. The courts of commerce are competent. "The power of the courts," says a commentator, "is extremely large in these cases. It goes so far as to make possible the closing by judgment of an establishment opened by a merchant for the sole purpose of competing unfairly with another." In general the courts may prescribe all measures considered necessary to prevent a future recurrence of the acts complained of. In appropriate cases measures of publicity may be ordered with a view to bringing the judgment to the attention of interested third parties. There are no penal provisions of law leading with unfair competition in general terms, as do certain sections of the German statute, but a number of laws having a penal sanction touch the subject at particular points.

It is impracticable to do more than merely enumerate the laws which in one way or another bear on the repression of unfair competition. The following list is taken from the report of M. Lucien Coquet, general secretary of the Comite du commerce francais avec l'Allemagne, to the International Congress of Chambers of Commerce recently held in Paris: Law of 1824 relative to names on manufactured products; Law of June 23, 1857, relative to trade marks; particularly articles 8 and 19; Customs law of January 11, 1892, article 15; Law of February 1, 1899, relative to foreign wines; Law of August 1, 1905, relative to fraud in the sale of foods and agricultural products; Law of July 11, 1906, relative to the conservation of sardines, vegetables and plums, recently extended to include conserves of fish; Law of August 8, 1912, relative to industrial awards at expositions; Law of 1793, 1806, 1902 and 1909, relative to industrial designs and models; Law of July 1, 1906, relative to the application in France of the international conventions on industrial property.

France is a member of the general union for the protection of industrial property, the two Madrid conventions of 1891 relative to the suppression of false indications of origin and the international registration of trade marks, and the convention of Berne of 1886, revised at Berlin in 1908, for the protection of literary and artistic property.

APPARATUS FOR CLEANING YARN

The illustration shows an apparatus used in connection with a German process for cleaning yarn, recently patented in this country and which is described by the inventor as follows: As is well known, weaving yarns, especially those of flax, hemp, jute and cotton, are liable to have attached, numerous vegetable fragments, which injure the fabric and should be removed before the yarn is



APPARATUS FOR CLEANING YARN

woven. In this process of removal it is desirable that the small filaments adhering to the yarn shall not be removed along with straws or other foreign bodies.

The object of the present device is to provide new and practical arrangement for the cleaning of yarn. A series of rough bodies are freely suspended and between which the threads are guided in close contact. It is moreover advantageous to support the cleaning bodies in a liquid through which the filaments pass. The cleaning parts are preferably formed of wood in order to make them as light as possible and are covered with some hard substance such as Naxos emery. By an arrangement of this kind, the threads are easily separated from the adherent strawy filaments without any injury. By the free suspension of the cleaning bodies any breakage of the filaments is prevented, because the suspended parts can easily move apart. The filaments are shaken or set in motion by suitable mechanism, and consequently impelled frequently against the cleaning parts. On the passage of the filaments through the liquid receptacle in which also the cleaning bodies are immersed, a specially favorable action is obtained, as the liquid imparts to these bodies a greater inertia, so that they move away only to a very slight degree on contact. In order that the light bodies shall not float upward in the liquid, they are weighted to the requisite degree.

The accompanying drawing illustrates the apparatus. The filament, a, passes over the rollers, b, c, d, through the liquid receptacle, e. Close around the parts of the filament which dip into the liquid there are freely suspended on strings the cleaning bodies, f, and brought as near as possible to the filaments.

The filament is preferably guided vertically into the receptacle because in this manner the cleaning bodies can be suspended at various heights close to the filaments. In order to shake the filament about, it can on entrance into the liquid, and if needful also at other points during its passage be seized by suitable levers provided with loops and caused to oscillate. For the same purpose also the rollers over which the filament passes might be caused to move about.

A TWISTED-NET FABRIC

The fabric shown in the accompanying illustrations has recently been patented in this country and is described by the inventor as follows: The object of the new construction is to provide a new and improved open work knitted fabric especially adapted for use in the manufacture of laundry and dyers' bags, which are subjected to hard wear and are sometimes cut or torn at different points. It is important that they should be so knitted that if torn the damage will be localized. This necessitates the knitting of the fabric in such manner that the threads shall be interlocked at very frequent intervals in the knitting operation so that it will be impossible to ravel any partcular thread or chain beyond a very small distance.

The fabric may be knit on a rib-lace machine in which only two guide bars, carrying two sets of needles, manipulating two sets of thread, are rendered operative. Two threads, one of one set and one of another set, are manipulated together as a pair and

caused to interloop to form chains extending in the direction in which the fabric is knit. Any given chain, however, is formed partly of the threads of one pair and partly of the threads of another pair, this being effected by causing the threads of a given pair, after they have been interlooped to form a series of loops of one chain, to be diverted laterally and then interlooped to form a series of loops of another chain, after which they are

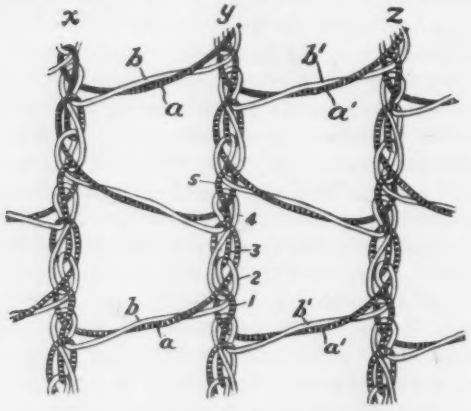


FIG. 1

diverted laterally in the opposite direction, and then interlooped to form another series of loops of the first chain, and so on. Between the first and last series of loops of the first chain is an intermediate series of loops formed by another pair of threads. At the junction between two series of loops of the same chain, one of the threads of the pair forming one of the two series of loops is looped around one of the threads of the pair, forming the other two series of loops, thus tying together the two series of loops.

One thread of each pair, which is called the locking thread, always performs the looping function, while the other thread of the pair, which is called the locked thread, is the thread which is confined by the loop of the locking thread of another pair; the locked thread at this point being itself formed into a loop through which extends the locking thread of the last named pair in its transverse extension toward the adjacent chain. The threads are thus interlocked at this point in such manner that accidental raveling is impossible in the event of breakage of any of the threads.

Fig. 1 is an enlarged face view of the fabric, which is distorted to show the longitudinal rows of loops extending in a straight line and to accentuate the open-work effect. Fig. 2 is a face view showing more accurately the appearance of the fabric. x, y and z represents three adjacent longitudinally extending chains.

a and b represent respectively the locking thread and locked thread of one pair of threads. a′ and b′ represent respectively the locking thread and locked thread of another pair of threads.

Threads a and b are interlocked to form a series of loops in the chain, x and then ex-

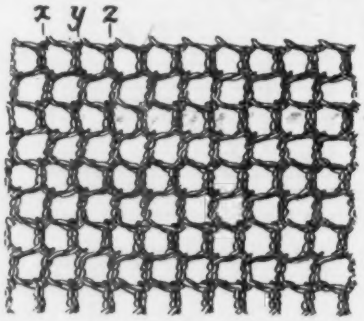


FIG. 2

tend transversely and form a series of loops in the chain, y, and then extend transversely to form another series of loops in the chain x; and so on. Threads, a′ and b′, are interlooped to form a series of loops in the chain, y, then extend transversely and form a series of loops in the chain z, and then extend transversely and form another series of loops in the chain y; and so on. Thus, the chain y is formed of a number of series of loops formed by threads a′ and b′ alternating with a number of series of loops formed by threads, a and b. The other chains are similarly formed partly of loops formed by one pair of threads and partly of loops formed by another pair of threads.

It will be observed, by reference to the lower part of the section of chain, y, that thread, a′, is formed into a loop which extends around thread b at two points in its

length; or more specifically, thread, a′, is formed into a loop, 1, which extends around the neck of a loop, 2, formed by thread, b. The loop, 2, formed by thread, b, is interlooped with a loop, 3, formed by thread, a, which thread also extends through loop, 2, formed by thread, b, and then extends, together with thread, b, transversely toward the chain, x. The loop, 3, formed by thread, a, extends around the neck of a loop, 4, formed by thread, b, which loop, 4, in turn extends around the neck of a fifth loop, 5, formed by thread, a; threads a and b, then extending transversely toward the chain, x.

ENGLISH NOTES

By Our Regular English Correspondent

Such American manufacturers as may be in trouble over goods made for the French army can hardly be cheered by an item of information given to a British woolen manufacturer by one of the leading lawyers in Paris. He was assured that there are disputes and lawsuits arising out of the war contracts of 1870 which are not yet disposed of. Large quantities of rejected French blue cloth are in dock warehouse in England and there is a widespread disposition to call the French authorities by hard names. One accusation against them is that as soon as they have a sufficiency upon hand they invent excuses for rejection by wholesale.

The Huddersfield and other manufacturers who had been led to make great quantities of French army cloth on the faith of a contract signed by numerous officials, but not signed by M. Milleraud have more reassuring news as to the prospects of acceptance. It is thought practically certain that the goods will be taken up, although the initial contractors may have to suffer for their error in judgment.

Although there are some prospects of new orders for the heavy overcoatings bought by the British War Office and also of contracts for knit goods, there is no further reason to look for new business in khaki serge at any early date.

* * *

The reorganization of the labor forces of this country is continuing. The cotton mills are to give up more of their men to the service of the State, the employers guaranteeing to reinstate them later. The first purpose to which the new National Register is being put is the unearthing of single men of military age. The register is a Census of the occupations of all people 15 to 65 years of age, giving both the present employment and the description of any other kind of work that the person is able and willing to undertake. Even persons engaged upon war contracts may be replaced by older men or by women.

Textile factories are not directly affected by the Munitions Act by which industrial premises may become a "controlled establishment" under rules which forbid workpeople to strike and provide for the limitation of the employer's profits. It is uncertain how the latter provision will work out. Engineering establishments which have been taken under control have been visited by officials who have ordered a balance to be struck at a specified date. The employers have been told to double or increase their production and men belonging to national munitions volunteer corps have been drafted into the works. Of the latter some are mechanics from mill repair shops who receive pay at not less than the rate obtaining in their own district and subsistence money at the army rate of 60 cents a day. The limitation of profits is obscured by the existence of current contracts and more experience is needed before anything definite can be said about it. The first object is very plainly the promotion of the output.

* * *

Probably some modification of the income tax will be introduced to deal with the exceptional profits which are being made in some quarters. Worsted spinners are making something like 24 cents a pound on coarse counts and up to 42 or 48 cents on the finer counts. Such are the extraordinary conditions of the trade that spinners who had been badly let down by a defaulting topmaker could cover their contracts at 24 cents advance upon their raw material and still not lose money. Their profit was extinguished and the spinners were of course discontented, but evidently their situation

might have been worse. There are flax spinners who have made at least as much money as in a normal year. Jute spinners have had prices in their favor. Silk spinners have been making severe losses and only a few cotton spinners have fared even passably. As in these times practically all profits are war profits it does not seem possible that they should escape selective taxation.

* * *

The importance of private and domestic saving is being urged by official leaflets on the public and consumers are cautioned incidentally against extravagance in clothing. Women of the richer classes are urged to make a smaller variety suffice, to ignore fashion and go without veils, white gloves, furs and silk garments. They are advised to make their own clothing, to cut down garments for the children and to put away their fancy needlework. Men are recommended to use fewer changes of clothing, dispense with sporting and holiday suits, get their old suits cleaned and pressed and economize on ties and gloves.

The recommendations are grandmotherly without being inquiring. The responsible Parliamentary Committee has neglected its opportunity of showing where the money spent upon clothing really goes, how little of it reaches the textile manufacturer and how much goes in tailoring, rents, interest, waste and intermediate expenses of every kind. A disposition to buy the most substantial stuff made up in the plainest manner could not hurt the textile industry in the end. Public extravagances in clothes arises rather more from the habit of putting appearance first than from any single cause. Two cheap articles at the price of one good one have been preferred for so many years that it will be hard to get back to the old-time economy. There is reason to say that current admonitions as to private economy would carry more weight were there more evidences of public and official economy.

* * *

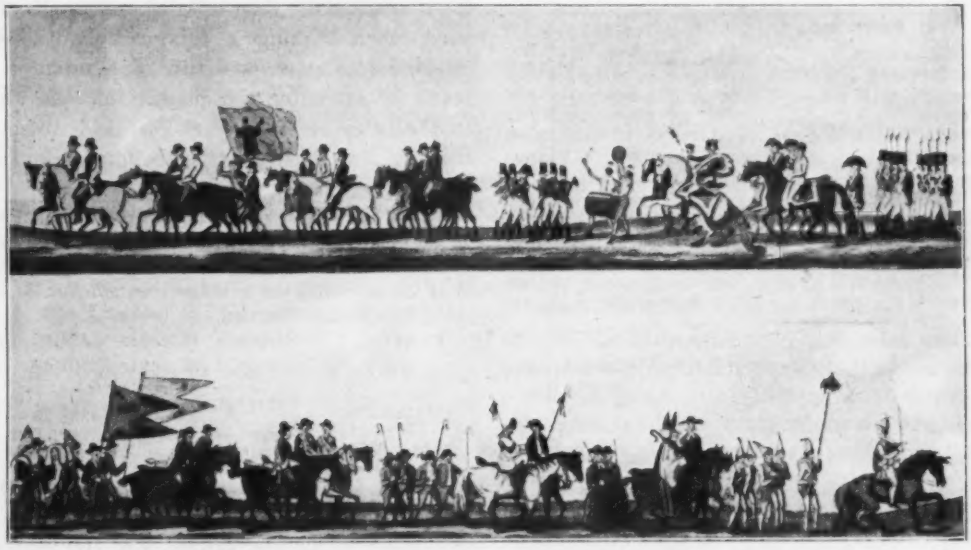
The dyestuff difficulty becomes more oppressively felt and manufacturers who can offer a variety of colorings are at a considerable advantage over those who cannot. Common colors are obtained fairly freely from anilines, indigo, logwood and fustic, not always in conspicuously fast and level dyeings, however. The trouble is over the fine shades and dyers are glad to get ounces of reds and violets of which they would ordinarily buy kegs. Intermediates are still being shipped to Switzerland to be converted into dyes, but the external supplies of tar colors remain small, the total imports in the first half of this year being less than seven per cent. of the quantity brought in during January-June 1914. More color is being made inland, but the provision of our adequate supply must necessarily be a slow business.

British Dyers Ltd. is still casting about for a site for the new works that is to be created. The policy of the company has been declared to have two objects—providing for the present and providing for the future. In regard to the immediate future the directors propose to set the conveniences of consumers first. In deciding what colors to make or whether to manufacture for themselves or supply intermediates to better-placed makers, they propose to let considerations of profit take care of themselves. The present resources of the concern in cash and uncalled capital are slightly less than $5,500,000 and the commercial control is now on amicable terms with a body of scientific advisers of the highest distinction.

* * *

Annual celebrations of the fame of Bishop Blaize fell out of fashion about one hundred years ago, but in a vague way the Bishop still ranks as the patron saint of woolcombers and, in some sort, of the whole wool trade. St. Blaize, head of the Church in Cappadocia and martyr under Licinius Caesar in A. D. 312, has been called by the exercise of a free fancy "our Bishop Blaize, who first invented combing" and the "great Author of our Combing Trade." He was hailed in this manner about fifteen hundred years later when he had become an excuse for carousals, but in sober fact his connection with textile art is more remote. According to the chronicles he was threatened, or killed, or seven of his women disciples were killed, with clawed instruments which by the license of art have gradually been

represented to be wool combs. The connection is a little obscure and appears not to have taken a definite form until eight centuries after his death. So much may be learned from H. Ling Roth's paper upon the Bishop, given to the Society of Antiquaries and now republished. It can, however, be affirmed that Blaize is the only recognized saint of the woolcombing business and the accompanying print of a "Grand Festival of Woolcombers, Comb Makers and Dyers at Darlington on February 3, 1825" shows him horsed and in full canonicals. Interpreting the Darlington procession in the light of the recorded detail of some other pageants, the leading figures may be accepted as masters and masters' sons, with slivers of wool around their necks and a Bishop Blaize banner held aloft. Following these soldiers is a horseman representing Jason, the bearer of the golden fleece and his bodyguard. The youths in fool's caps are manifestly the apprentices, behind whom follow the bishop with chaplain and acolytes. The shepherds are represented by the bearers of crooks and behind them are the foremen and woolsorters on horseback. The artist has not left himself space to deal adequately with the woolcombers who bring up the rear two by two, led by banners and wearing caps and wigs of white or dyed wool upon their heads. Such as it is, however, this reproduction of a contemporary print gives an idea of how these great events may have looked. The bishop, who is caricatured in the procession, is represented generally as a benign old gentleman.



BLAIZE CELEBRATION, DARLINGTON, 1825

* * *

Ideas of keeping down imports by taxing them are favorably received, but it cannot be assumed that the British Government will add largely to the number of taxable articles. To do so would be to add to the cost of collection and to necessitate an important enlargement of our small Customs organization. The established policy is to tax heavily a few articles rather than to tax lightly a great many. Consequently official notice will perhaps not be taken of the silk trade suggestion that imported silks should be made subject to a 10 per cent. revenue tax, when they might yield a gross $7,500,000 a year. The argument is that nothing less than 25 per cent. would stop imports, that silks are luxuries or nothing and that revenue could be raised without offence to the national Allies and friends. France, Japan, Italy and Switzerland are the manufacturing countries that would be principally concerned by such a change.

It is approximately true to say that in the first seven months of the year the British export of cotton yarns and fabrics to all countries is 33 per cent. less than it was a year ago and the export of wool, silk, linen and other goods 25 per cent. less. The comparison in this summary is based on values, not upon quantities, but for rough purposes the generalization is enough. Put another way about, British textile exports are about $168,000,000 behind upon the expired part of the year and about $120,000,000 of this defection occurs in cottons of one form or other.

Exports United Kingdom to U. S.

Seven months, Jan. to July 31st.

Cotton yarn	lbs.	3,580,800	3,476,800
Cotton piece goods	yds.	36,719,700	27,922,800
Worsted yarn	lbs.	1,372,400	456,400
Woolen tissues	yds.	5,644,000	2,538,600
Worsteds and stuffs	yds.	19,777,100	12,524,300
Carpets	sq. yds.	286,500	264,900
Spun silk yarn	lbs.	426,086	358,371
All-silk stuffs	yds.	125,889	84,659
Mixed silff stuffs	yds.	878,208	366,498
Jute yarn	lbs.	1,215,000	250,900
Jute piece goods	yds.	40,717,000	29,151,400
Linen yarn	lbs.	1,639,000	984,000
Linen piece goods	yds.	69,873,600	46,384,900

The foregoing information, taken in conjunction with the appended table of exports (recorded by quantity) to America shows that American business exhibits some departures from the general rule. Shipments of cotton goods to the United States have not fallen to the average extent and in most other important cases the trade has exceeded the general average. Otherwise, there is probably little to learn from the statement which could not equally well have been learned from any of the tables of the last few months. In a remarkable degree shipments of cotton yarn to America remain unaffected by the influences of warfare. Business in wool goods continues to reflect the consequences of the embargoes upon exporting. In view of the state of exchange between the two countries an increase in British sendings to America is to be desired upon the British side and this consideration is not lost to sight by those who are aspiring to get licenses to ship worsted tops and yarns. As consumer, the Englishman has no interest at all in seeing high prices for merino wool maintained by force of American demand. Upon general financial grounds the discharge of obligations to America by the direct shipment of goods is essentially to be desired.

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"STRAIGHT LINE" TEXTILE CALCULATIONS

BY SAMUEL S. DALE

(This series of articles began in July, 1915)

AVERAGE COST OF MIXTURES OF STOCK

Different kinds of stock are mixed together in certain proportions to give a mixture of a required cost or to produce certain effects in the goods. Both these results are usually desired when making a mixture of different materials. The average cost of a mixture is found by extending the quantity of each kind in the batch at its average cost and dividing the total cost thus found by the total weight of the batch.

Ex. A batch of 1080 pounds of wool is made up of 216 pounds Bagdad wool at 30 cents, 648 pounds Georgia wool at 45 cents, 216 pounds woolen waste at 15 cents. Find the average cost per pound.

216 pounds	Bagdad,	30 cents	$ 64.80
648 "	Georgia,	45 cents	291.60
216 "	waste,	15 cents	32.40
1080			$388.80

$388.80÷1080=36 cents, average cost per pound.

Usually the proportions are given by percentage and the average cost is then easily found by basing the calculation on a batch of 100 pounds, of which 1 per cent represents 1 pound.

In making mixtures of textile materials it is usually necessary to adjust the proportions of the different grades not only to the average cost, but also to the practical requirements of the manufacturing processes. Rules for calculating the proportions of materials of different values to give a particular average for the cost of the mixture are, therefore, seldom required. The following method adapted for two kinds of stock is however, given here:

Ex. Find the proportions in which wool costing 36 cents per pound must be mixed with wool costing 60 cents per pound to give a mixture costing 50 cents per pound.

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Low price	36	cents	per	pound
High price	60	"	"	"
Average price	50	"	"	"

The cheaper grade costs 14 cents per pound less than the desired average, and the more expensive grade 10 cents per pound more. The problem is to mix these two grades in such proportion that the 10 cents per pound on one will balance the 14 cents per pound on the other. It is clear that 14 pounds at 10 cents is equivalent to 10 pounds at 14; consequently the two grades are to be mixed in the proportion of 10 pounds of the 36 cent stock to 14 pounds of the 60 cent material. This method is stated in the following formula:

Average price — lower price = weight of higher priced stock.

Higher price — average price = weight of cheaper stock.

50 — 36 =	14	pounds	60	cents	=	$8.40
60 — 50 =	10	"	36	"	=	3.60
	24	"	50	"	=	12.00

This is equivalent to 58 1-3 per cent of the 60 cent stock and 41 2-3 per cent of the 36 cent material.

The proportions in which three or more different grades must be mixed to give any desired average price are calculated by the well known rules of alligation, but find so little practical application in mill work that an explanation need not be given. In most cases the manufacturer strives to mix his raw materials to give the desired effect in the goods at the lowest economical cost per pound. Of two mixtures of raw material, the one costing more per pound may, owing to the smaller quantity of waste made in the process of manufacture and better results obtained, produce yarn or cloth at less cost than would the cheaper mixture. For this reason the question of waste enters into all calculations of the cost of textiles.

COST OF MATERIAL IN PROCESS

In calculating the raw material cost of the product at any process of manufacture it is necessary to take into consideration: 1, cost of material before treatment; 2, loss during process; 3, value of waste products.

The cost of labor and supplies is excluded here and will be treated in another place.

The method of calculating the cost of material in process is very simple and is best explained by practical illustrations:

Ex. A batch of wool weighed 800 pounds and cost 48 cents per pound for raw material. The spun yarn weighed 680 pounds. There was 48 pounds of waste valued at 12 cents per pound and 24 pounds valued at 20 cents per pound made in the process of manufacture. Find the raw material cost of the yarn per pound.

800 pounds wool 48 cents		$384.00
48 pounds waste @ 12 cents	$5.76	
24 pounds waste @ 20 cents	4.80	10.56
		$373.44

$373.44 ÷ 680 = 54.9 cents, raw material cost of yarn per pound.

YARN AND CLOTH CALCULATIONS

Converting Yarn Counts from One System to Another. When the two systems of numbering are of the same class, both being based either on a fixed weight or a fixed length, the given count is easily reduced by multiplying it by the ratio between the two systems. For example, the ratio between the worsted and the cotton count is 1½, No. 1 cotton, based on 840 yards, being equal to No. 1½ worsted, based on 560 yards. Hence, cotton No. × 1½ = worsted No. Similarly, worsted No. × 2-3 = Cotton No. Likewise, 17.44 is the ratio between the denier and the dram count of silk. One dram silk is equivalent to 17.44 denier silk. Hence, denier count = dram count × 17.44.

The conversion can, likewise, be made by dividing by the respective ratios.

Thus, cotton No. = worsted No. ÷ 1½.

Dram = denier ÷ 17.44

Worsted No. = Cotton No. ÷ 2-3

A list of ratios and constants for reducing yarn counts is given under Yarn Numbering.

RECIPROCAL EQUIVALENTS OF FIXED WEIGHT AND FIXED LENGTH COUNTS

The method of converting one count into its equivalent by a system of a different class, for example, a fixed weight count to a fixed length count or the reverse, is based on the fact that the product of the fixed weight count and the

equivalent fixed length count is equal to a constant number. Thus, cotton No. × the equivalent in grains per 120 yards = 1000.

From this it follows that either of these two counts is equal to 1000 divided by the other.

This may be explained as follows: The cotton count is equal to the number of 120-yard lengths in 1000 grains. Hence the cotton count or number of 120-yard lengths in 1000 grains is equal to 1000 (grains) divided by the weight in grains of 120 yards.

The constant dividend used for these conversions represents the unit of weight corresponding to the given length and fixed weight count. The reducing constant for grains per 120 yards and the worsted count is 1500, which represents 1500 grains, the basis of weight for the worsted No. when the basis of length is 120 yards.

Yarn counts can also be reduced to equivalents by other systems, whether of the same or a different class, by finding the length of the given count per unit of weight and then reducing this length to the desired count.

Ex. Find the dram equivalent of No. 40 cotton:
840 (yards)×40=33,600 yards No. 40 yarn per pound
Dram count=pounds per 256,000 yards
256,000÷33,600=7.6 dram, equivalent of No. 40 cotton.

Ex. Find equivalent of 10 dram silk by the cotton system of numbering:
256,000 yards 10 dram silk=10 pounds
25,600 yards 10 dram silk= 1 pound
25,600÷840 (yards per hank)=30½, Cotton No.

Ex. Find equivalent of 62½ grain woolen yarn (25 yard basis) by woolen run, cotton, worsted and cut systems.
25 (yards)×7000 (grains per pound)÷62½ (grains) =2800, yards per pound.
2800÷1600 (run)=1¾ runs.
2800÷ 840 (cotton hank)=No. 3⅓ cotton.
2800÷ 560 (worsted hank)=No. 5 worsted.
2800÷ 300 (cut or linen lea)=No. 9⅓ linen or woolen cut.

Ex. Find equivalent of 1/80s worsted yarn by the following system: drams for silk, grains per 120 yards, grains per 50 yards, grains per 20 yards.
1/80s worsted=44,800 yards per pound.
Dram count=pounds per 256,000 yards.
256,000÷44,800=5.7 drams (pounds per 256,000 yards).
Grain per 120 yards=pounds per 840,000 yards.
840,000÷44,800=18¾ grains, count by 120 yards system.
Grains per 50 yards=pounds per 350,000 yards.
350,000÷44,800=7.81 grains, count by 50 yard system.
Grains per 20 yards=pounds per 140,000 yards.
140,000÷44,800=3.12 grains, count by 20 yard system.

Any other unit than the pound and yard may be used. For example, to reduce 3 dram silk to its run equivalent:
1000 (yards)×16 (drams per ounce)÷3 (drams)= 5333⅓, yards per ounce.
5333⅓÷100=53⅓ runs or 100-yard hanks per ounce.

The pound is, however, the most convenient unit for such conversions.

To avoid calculation, reciprocal equivalents of yarn counts by various systems are arranged in comparative yarn tables.

LENGTH, WEIGHT AND COUNT OF YARN

Any one of the three factors, length, weight and count of yarn, can be calculated from the other two. These calculations are of frequent occurrence in textile work.

COUNT FROM LENGTH AND WEIGHT

The count is calculated from the length and weight by the following formulas:

Length ÷ weight = length per unit of weight.
Length per unit of weight ÷ length of hank = fixed weight count.

The units of weight and length must correspond with the bases of the system of numbering.

Ex. 22,680 yards of cotton yarn weigh 3 pounds. Find the cotton count.

22,680 ÷ 3 = 7560 yards per pound.
7,560 ÷ 840 = No. 9 (hanks per pound).

Ex. A cotton warp 240 yards long with 2800 ends weighs 21 pounds. Find the count.

2,800 × 240 = 672,000, yards of yarn.
672,000 ÷ 21 = 32,000, yards per pound.
32,000 (yards per pound) ÷ 840 (yards per hank) = No. 38.1, (hanks per pound).

Ex. 864 inches of woolen yarn weighs 10 grains. Find the cotton No.

864 ÷ 10 = 86.4 inches per grain.
86.4 ÷ 4.32 (inches per grain) = No. 20 (4.32-inch lengths per grain).

Ex. 63 inches of worsted yarn weighs 1.2 grains. Find the count.

63 (inches) ÷ 1.2 (grains) = 52½ inches per grain.

52.5 ÷ 4.32 = 12.15, cotton No. or 4.32 inch lengths per grain.

No. 12.15 cotton = No. 18.23 worsted.

If the length is given in yards, then 12/100 yards (length of 1 grain No. 1) is substituted for 4.32 inches.

Ex. 24 yards of cotton yarn weighs 10 grains. Find the cotton No.

24 ÷ 10 = 2.4 yards per grain.

24. ÷ .12 = No. 20 (12/100-yard lengths per grain).

The count by any other system of yarn numbering is found by a reduction from the cotton No. or by calculating from the length of the hank on which the system is based.

Ex. 24 yards of yarn weighs 10 grains. Find count by worsted, run and cut systems. As in preceding example:

24 ÷ 10 = 2.4 yards per grain.

2.4 ÷ .12 (yard No. 1 cotton grain) = No. 20 cotton.

No. 20 cotton = No. 30 worsted = 10½ runs = 56 cuts.

Or the worsted count is calculated directly:

2.4 ÷ .08 (yard No. 1 worsted per grain) = No. 30 worsted.

Ex. 10 pounds of worsted yarn measures 168,000 yards. Find the worsted No.

168,000 ÷ 10 = 16,800, yards per pound.

16,800 ÷ 560 = No. 30 worsted.

Ex. The yarn on forty cops, each carrying 1035 yards, weighs 18 ounces. Find the cotton No.

1,035 × 40 = 41,400 yards.

41,400 ÷ 18 = 2,300, yards per ounce.

2,300 ÷ 52.5 (yards No. 1 cotton per ounce) = 43.8 cotton No.

Another convenient method consists in calculating the count from the weight of the hank or length corresponding to the unit of weight. This method is the same as that used for converting a fixed length count to its fixed weight equivalent or the reverse:

Unit of Weight ÷ weight of hank = Count.

Following are the convenient lengths used for this purpose:

Run.

1600 yard lengths	per	7000 grains
200 "	"	875 "
160 "	"	700 "
100 "	"	437 1/2 "
80 "	"	350 "
40 "	"	175 "
16 "	"	70 "
1 "	"	4 3/8 "

Cotton.

840 yard lengths	per	7000 grains
120 "	"	1000 "
60 "	"	500 "
30 "	"	250 "
15 "	"	125 "
12 "	"	100 "
6 "	"	50 "
3 "	"	25 "
2 "	"	16 2/3 "
1 "	"	8 1/3 "

Worsted.

560 yard lengths	per	7000 grains
120 "	"	1500 "
80 "	"	1000 "
40 "	"	500 "
20 "	"	250 "
10 "	"	125 "
4 "	"	50 "
2 "	"	25 "
1 "	"	12 1/2 "

Linen.

300 yard lengths	per	7000 grains
120 "	"	2800 "
60 "	"	1400 "
30 "	"	700 "
15 "	"	350 "
3 "	"	70 "
1 "	"	23 1/3 "

The use of these equivalents in calculating the yarn number from length and weight is illustrated by the following examples:

Ex. 300 yards of linen yarn weighs 250 grains. Find the No.

7000 (grains per pound) ÷ 250 = 28, linen No.

Ex. 1600 yards of woolen yarn weighs 1000 grains. Find the No.

7000 (grains per pound) ÷ 1000 = 7 runs.

Ex. 840 yards of cotton yarn weighs 140 grains. Find the count.

7000 (grains per pound) ÷ 140 = 50, cotton No.

Ex. 80 yards of worsted yarn weighs 50 grains. Find the count.

1000 (grains) ÷ 50 = 20, worsted No.

Ex. 10 yards of worsted yarn weighs 4 grains. Find the No.

125 (grains) ÷ 4 = 31¼, worsted No.

The count can also be determined by calculating the length of that weight of which the length in yards indicates the count. For example, 8 1-3 grains of 40s cotton yarn measures 40 yards:

Cotton.

Ex. Find count of cotton yarn of which 144 yards weighs 25 grains. The length in yards of 8 1/3 grains of this yarn indicates the count and is found as follows:

(8 1/3 × 144) ÷ 25 = 48, cotton No., or yards per 8 1/3 grains.

Worsted.

Ex. Find count of worsted yarn of which 96 yards weighs 33 1/3 grains. The length in yards of 12½ grains of this yarn indicates the count and is found by proportion as follows:

(12½ × 96) ÷ 33 1/3 = 36, worsted No. or yards per 12½ grains.

Woolen.

Ex. Find count of woolen yarn of which 36 yards weighs 35 grains. The length in yards of 4 3/8 grains of this yarn indicates the count and is found as follows:

(4 3/8 × 36) ÷ 35 = 4½, runs or yards per 4 3/8 grains.

Linen or Woolen Cut.

Ex. Find linen count or woolen cut of yarn of which 78 yards weighs 70 grains. The length in yards of 23 1/3 grains of this yarn indicates the count and is found as follows:

(23 1/3 × 78) ÷ 70 = 26, linen No. or yards per 23 1/3 grains.

Applications of various methods of calculating the count from weight and length are illustrated in the following examples:

Ex. A cotton cloth is set 67 ends and 66 picks per inch, 36 inches wide in the loom. Find the average count to make the goods weigh 4 ounces per yard, or measure 4 yards per pound. Average take-up 5 per cent.

67 + 66 = 133.
(133 × 36) ÷ .95 (yield) = 5,040 yards yarn per yard of cloth.
16 ÷ 4 = 4 ounces per yard of cloth.
5,040 ÷ 4 = 1260 yards per ounce.
1.260 ÷ 52½ (yards per ounce) = No. 24 cotton.

The calculation can also be made as follows:

5,040 × 4 (yards per pound) = 20,160 yards yarn per pound.
20,160 ÷ 840 (yards per No.) = No. 24.

Ex. A worsted warp 480 yards long, having 2800 ends, weighs 128 pounds. Find average count.

2,800 × 480 = 1,344,000 yards yarn.
1,344,000 ÷ 128 = 10,500 yards per pound.
10,500 ÷ 560 (yards per No.) = No. 18¾ worsted = 2/37½ worsted.

Ex. There are 40 ends woolen yarn each 360 yards long on a spool. The yarn weighs 4 pounds. Find the size in runs.

360 × 40 = 14,400 yards of yarn.
14,400 ÷ 4 = 3,600 yards per pound.
3,600 ÷ 1600 (yards per run) = 2¼ runs.

Ex. A half wool fabric is set 50 ends cotton, 70 picks worsted, 64 inches wide in the loom. Find counts of warp and filling to make warp weigh 4 ounces, filling 4½ ounces per woven yard. Take-up 5 per cent. in warp and filling.

(50 × 64) ÷ .95 = 3,368 yards warp per yard.
(70 × 64) ÷ .95 = 4,716 yards filling per yard.
3,368 ÷ 4 = 842 yards cotton warp per ounce.
4,716 ÷ 4.5 (ounces filling per yard) = 1,048 yards worsted filling per ounce.
842 ÷ 52½ (yards per ounce) = No. 16 cotton warp.
1,084 ÷ 35 (yards per ounce) = No. 31 worsted filling.

Ex. Find the count of filling yarn in a cotton cloth woven with 2,160 ends of 60s warp, 29.6 inches in loom, 80 picks per inch. Woven weight is 12 yards per pound. Allow 3 per cent. for take-up in warp and filling; and 4 per cent. for size on warp.

2,160 ÷ .97 = 2227 yards 60s warp per yard cloth.
2,227 × 12 = 26.724 yards 60 warp in 12 yards cloth.
26.724 ÷ (840 × 60) = .53 pound unsized warp in 12 yards cloth.
.53 × 1.04 = .55 sized warp in 12 yards cloth.
1 — .55 = .45 pound, weight of filling.
29.6 × 80 = 2,368.
2,368 ÷ .97 = 2,441 yards filling per yard cloth.
2,441 × 12 = 29.292 yards filling in 12 yards cloth.
29.292 ÷ .45 = 65,093 yards filling yarn per pound.
65,093 ÷ 840 = No. 77.5, cotton filling.

Ex. Find the count of warp in a cotton cloth measuring 4 yards per pound, made 36 inches wide with 1,728 ends and 52 picks of 20s yarn. Allow 6 per cent for take-up in warp and 5 per cent in filling.

(36 x 52) ÷ .95 = 1,970 yards filling per yard.

1,970 x 4 = 7,880 yards 20s = 7.5 ounces filling yarn in 4 yards (16 ounces) of cloth.

16 — 7.5 = 8.5 ounces warp yarn in 4 yards of cloth.

(1,728 x 4) ÷ .94 = 7,353 yards warp in 4 yards of cloth.

7,353 ÷ 8.5 = 865 yards warp yarn per ounce.

865 yards warp yarn per ounce = No. 16½, warp.

Ex. Find count of filling in a cotton cloth measuring 4 yards per pound, 36 inches wide, 60 x 80, warp No. 40. Allow 6 per cent for take-up in warp and filling.

(60 x 36 x 4) ÷ .94 = 9,191 yards warp yarn in 4 yards (1 pound) of cloth.

No. 40 yarn = 33,600 yards per pound.

9,191 ÷ 33,600 = .273 pound warp in 4 yards of cloth.

1 — .273 = .727 pound filling yarn in 4 yards of cloth.

(36 x 80 x 4) ÷ .94 = 12,256 yards filling yarn in .727 pound.

12,256 ÷ .727 = 16,857 yards filling yarn per pound = No. 20, filling.

Ex. Find count of filling required for a worsted serge woven 65 inches wide, 56 picks single worsted, to make filling weigh 5½ ounces per yard from the loom. Take-up 5 per cent.

(65 x 56) ÷ .95 = 3,831 yards filling yarn.

3,831 ÷ 5.5 = 696 yards per ounce.

696 ÷ 35 = 20s, worsted filling.

Ex. Find count of 2-ply warp for a cotton warp thibet, 2,400 ends, to make warp weigh 2½ ounces from the loom. Take-up, 7 per cent.

2,400 ÷ .93 = 2,581 yards warp yarn.

2,581 ÷ 2½ = 1,032 yards per ounce.

1,032 ÷ 52½ = 2/40s, cotton warp.

Ex. Find count of woolen filling in a cotton warp thibet woven 85.7 inches wide, 48 picks, to make filling weigh 13.3 ounces from the loom. Take-up, 5 per cent.

(85.7 x 48) ÷ .95 = 4,329 yards filling.

4,329 ÷ 13.3 = 325 yards yarn per ounce.

325 yards per ounce = 3¼ runs, filling.

Ex. A beaver is made with 3,840 ends, dressed 2 woolen face 1 single 14s cotton back. Find count of face yarn to make warp weigh 9.8 ounces from the loom. Take-up 8 per cent.

1,280 ÷ .92 = 1,391 yards back warp.

2,560 ÷ .92 = 2,783 yards face warp.

1,391 yards 14s cotton = 1.8 ounce.

9.8 — 1.8 = 8 ounces face warp.

2,783 ÷ 8 = 348 yards per ounce.

348 yards per ounce = 3½ runs, face warp.

Ex. A kersey cloth weighs 22½ ounces per finished yard, 54 inches wide between selvages. The selvages weigh ½ ounce per yard. The loom layout is 3,200 ends 9½ x 4 reed, 84.2 inches wide in loom, 44 picks. The cloth shrinks 18 per cent in length and loses 16 per cent in weight in finishing. The take-up in weaving is 6 per cent in the warp and 5 per cent in the filling. Find count of warp and filling, which are spun to the same size.

22½ — ½ = 22 ounces per yard between selvages.

(22 ÷ .84) × .82 = 21½ ounces from loom.

3,200 ÷ .94 = 3,404 yards warp.

(84.2 x 44) ÷ .95 = 3,900 yards filling.

3,404 + 3,900 = 7,304 yards warp and filling.

7,304 ÷ 21½ = 340 yards yarn per ounce = 3.4 runs, warp and filling.

Ex. A cotton warp with 2,100 ends is 400 yards long and weighs 50 pounds. Find the count.

2,100 x 400 = 840,000 yards.

840,000 ÷ 840 = 1,000 cotton hanks.

1,000 ÷ 50 = No. 20 (hanks per pound.)

Ex. A woolen melton warp, 240 yards long, 2,400 ends, weighs 160 pounds. Find count in runs.

2,400 x 240 = 576,000 yards yarn.

576,000 ÷ 160 = 3,600 yards per pound.

3,600 yards per pound = 2¼ runs.

Ex. A worsted warp 320 yards long, 2,800 ends, weighs 114¼ pounds. Find count of yarn.

2,800 x 320 = 896,000 yards yarn.

896,000 ÷ 114¼ = 7,842 yards per pound.

7,842 ÷ 560 = No. 14 worsted.

Ex. A kersey is made with 4,320 ends, dressed 1 face 3½ runs, 1 back 2¾ runs. The warp take-up is 8 per cent. The cloth shrinks 12 per cent in length and loses 20 per cent in weight in finishing. The goods weigh 24 ounces per yard finished and it is desired to increase this weight to 24½ ounces, the entire gain to be in the backing warp. Find size to which backing yarn must be spun to give the desired increase. Warp take-up, 8 per cent.

(24 ÷ .80) x .88 = 26.4 ounces per woven yard for 24 ounces finished.

(24.5 ÷ .80) x .88 = 26.94 ounces per woven yard for 24½ ounces finished.

26.95 (ounces)—26.40 (ounces) = .55 ounces woven to be added.

2,160 ÷ .92 = 2,348 yards back warp.

2,348 yards 2¾ run yarn = 8.53 ounces back warp in 24 ounce goods.

8.53 + .55 = 9.08 ounces back warp in 24½ ounce goods.

2,348 ÷ 9.08 ounces = 258 yards per ounce.

258 yards per ounce = 2.6 runs, back warp for 24½ ounce goods.

Ex. The 24-ounce cloth in the preceding example is woven 78½ inches wide in the loom, with 48 picks of 4¼ run filling; the filling take-up is 5 per cent. It is desired to make the increase to 24½ ounces per yard by increasing the size of the filling. Find size to which filling must be spun.

(48 x 78½) ÷ .95 = 3,966 yards.

3,966 ÷ 425 = 9.33 ounces filling for 24 ounce goods.

9.33 + .55 = 9.88 ounces filling for 24½ ounce goods.

3,966 ÷ 9.88 = 401 yards per ounce.

401 yards per ounce = 4 runs, filling for 24½ ounce goods.

(To be continued)

SHEEP DIPS IN URUGUAY

From Herman L. Spraht, American Consul at Montevideo, Uruguay

June 17, 1915.

In the original report on this subject an error was made in a statement regarding the composition of certain dips, which the Consulate takes this opportunity to correct, adding other information concerning sheep and cattle dipping.

The following is a list of the best known dips sold in Uruguay:

Cooper's Powder Dip, composed principally of sulphur and arsenic, is the most widely used, both for sheep and cattle dipping.

Cooper's Paste Dip, a fluid paste composed mainly of sulphur, arsenic and fenole.

Cooper's Fluid Dip, a liquid dip composed mainly of crude cresols.

Cooper's Special Tick Killing Fluid, an arsenical fluid preparation for destroying tick. It is said to be the only proprietary dip approved for this purpose.

The foregoing dips are prepared for farmers at the Montevideo branch factory of William Cooper and Nephews, of Berkhamsted, England. All the preparations are applicable both for sheep scab and tick killing, although the powder and the special tick fluid are used for the latter purpose. The manager says that positively no tobacco or lime enters into the composition of any of their products and that the sales of his company are sufficient to dip 60 per cent. of all the flocks in the country. The powder dip is very popular for cattle dipping as well, although the company has a large sale for its special cattle fluid.

Strauch's Paste, composed principally of arsenic, sulphur and crude cresols.

Strauch's Fluid Dip, whose principal ingredients are cresols and sulphur. These two dips are manufactured here by Strauch & Co.

Cabezali & Illa Font, local manufacturers of a powder dip composed mainly of lime and sulphur, and of an arsenical preparation in fluid form for tick killing. Tickol is a locally made arsenical fluid and paste preparation for tick. Besides there are various smaller factories preparing on a small scale fluid dips with a lime and sulphur composition, extract of tobacco and creolinas, although this last preparation is used mostly as a disinfectant. Strauch & Co. are the largest manufacturers in this line, of which they make a specialty and in which they do a large business, with a side line of sheep dip fluids, pastes, etc.

Johnston's Paste and Macdougall's Fluid, manufactured in England and Scotland, respectively, and sold here by Guillermo Johnston & Cia.

Buchanan's Paste, manufactured in England and sold here by Wilson Bros.

Little's Fluid, manufactured in England and sold here by John J. Hore.

Lawes' Fluid, manufactured in England and sold here by Edward Cooper & Son.

The above are the principal imported dips, whose ingredients are principally sulphur and arsenic, but various fluid and powder dips are on the market. A number of tobacco dips in fluid form are imported and used mostly for hand curing. The sale of imported dips is small at present, probably not over 20 per cent. of the total sales, owing to the high duties, which amount to from 40 to 60 per cent. It is said that the dips manufactured here are sold at about the same prices as were asked for the various dips before the extra duty was put on.

All dips now on sale have been analyzed, tested and approved by the Government,

and no new dip can be introduced until this is done. The Government keeps the analyses on file and from time to time takes samples for re-analysis. Any dip found below the standard is confiscated and prohibited and a heavy fine is imposed.

The vats for sheep and cattle dipping are more or less the same as are used in other countries. The sheep are generally dipped twice after shearing and the operation is repeated three or four months later. If scab breaks out afterwards hand curing is usually employed. The sheep are kept in the vats for about a minute, a dipping crutch being used to submerge their heads. Dipping has no harmful effect upon the meat, but the animal should preferably rest several days afterwards before being killed, as otherwise the meat would be in the condition here called "tired."

WEAVING TUBULAR GOODS

A method of weaving tubular goods has recently been patented in this country. The illustrations show the construction of the fabric, which is described by the inventor as follows: The invention consists in a tubular woven fabric having a plurality of sides meeting at angles, the corners being angularly defined in the weaving. The tubular fabric has an opening extending transversely across manifold warp-spaces as well as longitudinally of the warps, with the lateral margins formed with selvages produced in the weaving. The tube is made with a longitudinal slit to fit it for a vehicle lamp cover.

Fig. 1 is a view of a woven tube embodying the features of the construction. Fig. 2 is a view showing the slitted side of the tube. Fig. 3 shows the method of weaving the plain portion of the tube, and the general fabric-structure. Fig. 4 shows the portion of the tube containing the transverse opening and the narrow longitudinal slit, and the method of weaving. Fig. 5 shows a fabric woven without the slit.

The tube, Fig. 1, has four sides meeting at right-angles. In the present instance the sides, 1 and 2, are of continuous fabric, without openings or slits. Side 3 is formed with the wide transverse opening or window, 3a, having the opposite selvage lateral margins, 3b, 3b, which are finished in the weaving. Side 4 is formed with the narrow longitudinal slit, 4a, having the margins thereof selvaged, finished in the weaving.

Figs. 3, 4 and 5 illustrate the general manner of weaving the rectangular tubular web or fabric of Fig. 1, in a flattened state and in

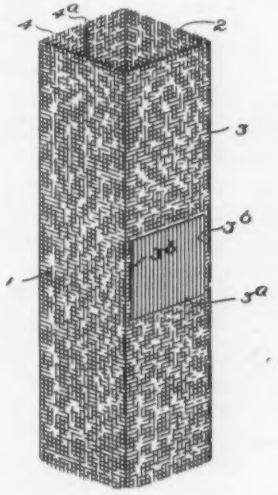


FIG. 1

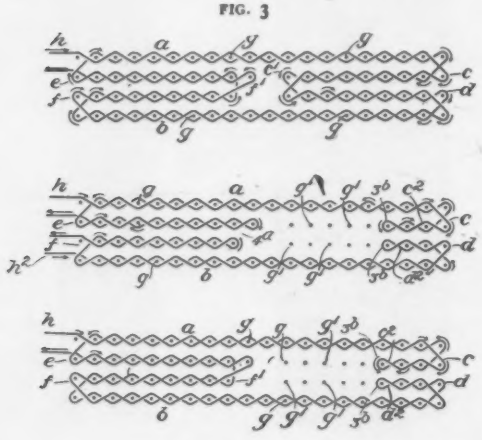
FIG. 2

four superimposed plies at each side of the center of the web, all joined together in the weaving. The top and bottom plies, a and b, correspond to the sides, 1 and 2, Fig. 1, and in the fabric as woven in a loom the plies are extended transversely and flat to the full width of the sides. The two narrow intermediate plies, c, and d, at the right in Figs. 3 and 4, constitute the side, 3, in a state doubled upon itself transversely and lying between the plies, a and b. The two narrow intermediate plies, e and f, at the left constitute the side, 4, similarly doubled upon itself. The warp-threads are marked g, g, in Figs. 3, 4 and 5.

In weaving a plain tube, as in the lower portion of the tubular fabric, Fig. 1, below the opening, 3a and slit 4a, the threads are interwoven substantially as in Fig. 3. In the latter a single weft-thread, h, is employed. Starting at the left in Fig. 3, the first pick

of the weft-thread, h, extends from the extreme left to the extreme right through the top ply, a. The second pick extends from the extreme right through the upper right-hand intermediate ply, c, to the transversely-intermediate point, c. The third pick extends from point, c, from left to right through the lower right-hand intermediate ply, d, to the extreme right. The fourth pick extends through the bottom ply, b, from the extreme right to the extreme left. The fifth

FIG. 3



FIGS. 4 AND 5

pick extends from left to right through the lower intermediate ply, f, to the transversely-intermediate point, f. The sixth pick extends from right to left through the upper left-hand intermediate ply, e, to the extreme left. The seventh pick extends from the extreme left to the extreme right through a second shed in the top ply, a, and in like manner the eighth, ninth, tenth, eleventh, and twelfth picks extend in the same directions respectively as the second to sixth picks, through the remaining successive plies, but through a second shed in every such ply.

One round or repeat of the weave is completed by the return of the weft to the starting side in Fig. 3, after completing the pick from right to left through the left-hand upper intermediate ply, e.

In consequence of the outer portions of the right-hand intermediate plies, c and d, being joined in the weaving to the right hand portions of the top and bottom plies, a and b, and in consequence of the inner portions of such intermediate plies being joined together in the weaving, the plies, c and d, constitute one side of the tube of Fig. 1 when straightened out in line transversely with each other by moving the sides that are constituted by the top and bottom plies, a and b, apart from each other.

A TIMELY WARNING

The Committee on Public Information of the National Fire Protection Association, 87 Milk St., Boston, Mass., has issued the following bulletin to its correspondents:

The Pittsburgh Press of August 13th contained the following advertisement disguised as a reading notice:

SAYS ANY WOMAN CAN DRY-CLEAN.

Put Gasoline and Solvite in a Wash Boiler and Save Five Dollars.

Pittsburgh ladies will never again pay enormous prices for dry cleaning after trying this. Any woman can clean and renew the appearance of yokes, ribbons, satins, laces, silks, furs, shirtwaists, swiss, lawn, organdy and chiffon dresses, kid gloves and shoes, neckties, children's clothes, suits, caps, woolen garments, fancy vests, draperies, rugs, in fact, any and everything that would be ruined with soap and water.

Get two ounces of Solvite at any drug store and put it in two gallons of gasoline, where it quickly dissolves. Then put in the goods to be cleaned. After a little rubbing, out they come looking bright and fresh as new. You will find nothing fades, shrinks or wrinkles, requiring no pressing.

You would have to pay $5 at a dry-cleaning establishment for the cleaning which can be done at home as easily as laundering. Any grocer or garage will supply the gasoline and your druggist will furnish the Solvite, which is simply a gasoline soap. Then a large dish-pan or wash boiler completes your dry-cleaning outfit.

It may be assumed that the people paying for this advertisement are making a drive for business with newspapers willing to accept mischievous advertisements of this sort in at least all of the soft coal consuming territory where the demand for dry-cleaning is greater than in cleaner localities. The menace to human life involved in such reckless use of gasoline by those who are unfamiliar with its dangers should furnish a motive to those in authority for the taking of drastic measures to discourage a propaganda of this character. Frank H. Wentworth, Chairman.

HOW A DESIGNER MADE GOOD

BY RUTLEDGE

Some years ago a woolen manufacturer in one of the New England States engaged me to go to his mill and make a line of woolen samples. The designer he had was being retained to work only on his own regular line. A lot of pattern ranges and selling ends had been made which were all right in fabric, but deficient in style and color. The manufacturer, who was also the head of his selling force in New York, showed me the samples already made and explained their deficiencies. I soon found out what was required and what to do after getting to the mill, where I arrived along with the manufacturer one Monday morning. After being introduced to the superintendent and designer, and finding a boarding place, I was ready for work in the forenoon. My first visit was to the dyehouse where there was a good dyer and most of the shades wanted already on hand. It did not take long to decide upon eight good shades to use, which, with a percentage of bright colored nubs, gave me everything that was necessary. The lots got on the cards the same day. The manufacturer seemed pleased with the progress already made, but was anxious to get finished results and said he would come to the mill twice a week to see the samples. As he was a man of ability and quick action I was anxious to keep up my end in every respect.

The other designer had been told that my work was to have the right of way. Knowing that I could do him a good turn he was content to drop into second place. The superintendent, except to attend to my wants by supplying yarns, totally ignored me, evidently suspecting there was something behind my designing duties. The sample yarns came along in good time and I started the work of getting out pattern ranges and soon came to my first stumbling block. There was only one reel for sample work which was operated by a fresh young man, a son of the superintendent, who showed plainly by his actions that he for one was not interested in my success. He persisted in giving the old work precedence over mine on the ground that he had received it first. And on my protesting to his father, he said the boy had too many bosses. I was satisfied that a change was necessary anyhow as in the few warps that had been dressed for me, a considerable part of the yarn had been wasted. The manufacturer came to the mill the next day and was disappointed at the small display of pattern ranges ready for him. Wishing to keep from him the fact that any friction had occurred, I simply told him that the dresser complained of having too much work to do and had fallen behind, also that the reel was not economical for dressing short pattern ranges. I asked him to provide me with a carpenter for the next day, which was Sunday, and I would give him a sketch from which to make a set of dressing pins to affix to the wall, also a bobbin frame to dress from. Having these I could do the work myself and save the yarn. This was done and that trouble was overcome.

Things went along very well for two weeks, when I met my second, but last reverse. A young woman who drew in the sample warps alongside of the dressing reel, suddenly slowed up in her speed and upon my giving her a hint that time was precious, she created a scene and quit work. As no other drawer-in could be got I did the work myself. Ever since my first trouble I had been planning how to act in case of another one, and had been looking around for support in case of need. The help had noticed that my work was giving satisfaction and had become very friendly towards me. The drawer-in girl in the weaving room was kept pretty busy there, but kindly offered any assistance she could give, which was gratefully accepted and came in very useful. There was one narrow loom and three old broad ones at work upon the samples, so I appropriated the new narrow one together with a good pattern weaver and told the other designer that he could have all the others. I had figured out that by arranging my ideas well ahead and putting warps into the loom in order, that others of the same drawing-in draft could be tied onto the end of the one in the loom, so that the work of

drawing-in could be reduced to the point where the assistance given by my friend in the weave room would be sufficient. This plan, with the following procedure, was adopted: I spent my time mostly between the dressing pins and pattern loom, which were near each other. When any change in the pattern warp was required I was on hand to assist with it and when completed in the loom had another one ready. If possible, that could be tied on. The pattern weaver and myself then got together, removed the empty beam, put another warp on and put it back in place. Each then tied on one-half of the warp, beginning from the center, and were soon ready for a new start with the loom. This system of team work was a revelation to a good many, and eventually cured the labor trouble. The manufacturer got all the pattern ranges he wanted and used them to good advantage in getting a full season's work for the mill. I was asked to accept a permanent situation, but had to decline on account of family reasons.

TESTING CLOTH FOR ITS WEARING QUALITIES

A process developed in Germany for testing the resistance of cloth to wear has recently been patented in this country. It is described by the inventor as follows: It has been the general practice to test the quality and strength of cloth by determining the elasticity and the resistance to tearing. It has, however, been observed that in the great majority of cases the values thus obtained do not yield a correct measurement of resistance to wearing, and the quality of cloth could not be determined but by prolonged wearing-tests, as it is the general practice of the military authorities. Scraping and rubbing have been tried in order to obtain a better method for testing the cloth, but the values thus obtained were so inexact and incorrect that no conclusions could be drawn therefrom. The royal office for the testing of materials at Lichterfelde stated that it was not possible to test in this way.

It has now been discovered that an excellent measure of the resistance of cloth to wear and tear is obtained by treating it previous to testing in such a way that the interior parts and the surface become perfectly uniform, and then testing the cloth on a scraping, rubbing, or other kind of grinding or beating machine. A perfect evenness of the interior and the surface of the cloth is the significant point of the invention and may be attained by the following means: (a) the samples are first thoroughly wet and then dried and evenly pressed; (b) the samples are boiled in water alone or in water containing slight quantities of alkalis, acids, glycerin, sulfoleates or other mild substances, and subsequently dried and pressed; (c) the samples are treated with alcoholic or ethereal liquids or hydrocarbons and dried; (d) the samples are evenly raised by mechanical means and then pressed.

The treatments may be modified according to requirements or one may be combined with another. Very good results are obtained by treating one hour with alcohol, then 1/2 hour at 180°-190°F. in water and after drying and uniform pressing finally testing on a scraping machine. The various kinds of military cloth in use in Germany have given the following comparative values on an average on being subjected twice to comparative tests:

	Dynamometer		Scraping machine after preparatory treatment
	Breaking Strain	Elasticity	
	pounds	*inches*	
Dark blue cloth for coats	148	4.5	93
Medium blue cloth for coats	145	4.3	100
Blue mixed shade cloth for trousers	152	4.6	118
Fieldgray cloth for coats	149	4.8	84
Fieldgray cloth for trousers	159	5.3	90

Experience shows that the values obtained by the new method are more reliable than by the old. A further proof is obtained by treating the cloth with substances which undoubtedly deteriorate the wool, such as soda or chloride of lime and subsequently testing it comparatively on a dynamometer and on a scraping machine after the preparatory treatment.

Fieldgray miltary cloth was treated as described and then tested.

	Testing on the dynamometer.		Testing on the scraping machine after the treatment indicated above.
	Breaking strain.	Elasticity	
	pounds	*inches*	
(*a*) Fieldgray cloth.....	147	4.7	100
(*b*) Cloth (*a* boiled one hour with 40 times its weight of water to which ½ part soda ash per 1000 parts had been added.....	149	4.	94
(*c*) Like (*b*) with 1 gram soda ash per liter.....	136	3.2	67
(*d*) Cloth (*a*) treated with chlorid of lime 1/5° Baume by first acidulating the cloth, then chlorinating, acidulating and finally rinsing until neutral.. ...	176	4.1	76
(*e*) Like (*d*) with chlorid of lime 2/5° Baume.....	171	4.	64

It is to be noticed from these figures that the breaking strength and elasticity as shown by the dynamometer is but slightly diminished whereas the new method of testing shows a gradual decrease up to 33 per cent. It is further demonstrated that the values of breaking strength are considerably increased by the treatment with chloride of lime and the elasticity is but slightly diminished whereas the new method of testing indicates deteriorations of 34-36 per cent.

That the values obtained by the new method are more correct is shown by the fact that the treatment with soda is detrimental to the wool and that chlorinated wool, so-called silk-wool has been found to be much less durable to wearing than non-chlorinated wool.

The Island of Guam in the Pacific, one of our Oriental possessions, has been found adapted to cotton growing. Samples of Guam cotton sent by navy officials to the consulate at Shanghai have been found suitable for the manufacture of cotton cloth in China and Shanghai dealers are willing to enter into negotiations for the purchase of the entire crop of the Island if prices are satisfactory.

MILL EXPERIENCES

Under this head we will publish from time to time stories from practical mill men, telling of vexatious and unusual difficulties which have occurred in different branches of mill work, and how they have overcome them. We invite mill men to send us an account of such experiences. We pay, of course, for all that we use. Facts told just as you would tell the story to a friend are what we want, not fancy writing.

EXPERIENCE IN A COTTON CARD ROOM

BY GRENADA

Some twelve years ago I received an offer of a position as carder in one of the large New England mills. When looking the room over before accepting the offer, I was taken through the mill at a dog trot and upon returning to the office was asked to state my opinion of the place. I told the agent that the mill was in pretty bad shape, but he and the agent did not agree with me. They were satisfied that I was the man for the job and after thinking the matter over for two days I decided to take a chance. The first morning I was surprised to find two grinders out of four were absent and three fixers out of the five had jacked up because they had heard that the new boss was a hard man and they thought they might as well leave as get fired. The same week nine drawing hands were missing one morning. This did not surprise me as they were men above 21 years of age working for $5.50 per week. When I asked the second hand what he generally did under such circumstances, he replied: "We take the grinders off the cards and make the fixers help out." The cards looked it. It took but a short time to secure some good fixers and we put girls on the drawing frames.

It was a common thing to send two to three thousand pounds of card sliver and drawing waste back to the picker room every day from a room producing eleven thousand pounds a day. The drafts in the drawing frames were the strangest I have ever seen. Between the third and fourth rolls the draft was 2.20; between the second and third rolls, 1.15; and between the first and second, 2.56. There were three processes of drawing and the sliver was cloudy and cut. After

taking out one process and revising the drafts, as we were on very coarse work, the sliver gave no further trouble behind the slubbers.

The cards apparently had been set with a shovel, for the laps were full of lumps and it was not an uncommon thing to hear and see about one-quarter of the lap jump in the licker-in. I had never seen so many jams and pushed back clothing as I saw in this mill.

There were can boys on every sixteen cards and card men who took care of the backs, and there was a kick most of the time between them. The laps were allowed to run out and when the card tender put them in he did not bother about the front, consequently the web went around many times and spoiled the doffer. I gave the card tenders 55 cents more per week and let the can boys go. We got some good grinders and put on some new clothing. I did not go around one of the grinders while he was a setting a card that he did not hand me the gauge and ask if it was right.

The next thing was to look the pickers over and make the laps even. This was done by reducing the pin beaters from 1700 to 1050 revolutions per minute, and putting a split lap on. The fan speeds were lowered, but when we attempted to reduce the beaters the agent objected. He then consulted the people who made the pickers and they said it was not possible. However, I changed one and had the agent and the representative from the firm that built the pickers inspect the laps. The agent told me to go ahead, but the shop man would not give in. I have noticed, however, that of late years these people are recommending slow beaters.

The next thing was to adjust the intermediate and fly frames. About 20 per cent. of the roving was run over or under and there was no end of waste from this source as the tenders were not even careful in doffing. When the next hand got them, off came the end and hence plenty of waste. The lay, twist and tension were arranged and later bad slubber roving was entirely eliminated.

The intermediates were of an old type and had loose bolsters, that is, bolsters that could be moved from side to side if they were pushed on the spindle or flyer. These bolsters were full of dirt and every time the rail came to the bottom change, the tender had to run to the pulley and help the frame over the change or it would stick there and make a bad set. I hired four good filers and set them to work filing a worm on the spindles so that the bolster was cleaned out every time the rail went down. The frames, of course, were all cleaned before the filed spindles were put in the frame.

After the frames were put in shape the tenders dropped that tired, irritable expression and were more contented. They got credit for the hanks they turned off, which was more than they were receiving with their allowance. There were eight men and a boss roving fixer who did nothing but fix the bad roving that was returned from the spinning room, but I gradually reduced this number and if a tender received four bobbins of double or single in one week she or he were dismissed. In a short time it was seldom a hand would let any go by, for I had the fixers and second hands walk up and down the alleys twice a day and look for bad work on the frames. This I also did myself and the tenders knew there would be trouble if any bad work was found. The boxes of roving were pushed into the spare alley and whenever the fixers, second hand or myself went by we looked the boxes over. The increase in production amounted to about 25 per cent. in eight months and I reduced the number on the pay roll by 27 hands. The beam weights were jumping all around. I have seen beams of 400-pound standard go from 390 to 450 pounds. The fixers were changing drafts all the time trying to get them right and the spinner was changing the filling almost every day. This trouble, however, was rectified and the mill was soon running in good shape. My efforts were appreciated, but when the superintendent resigned I was considered too energetic or perhaps they had some other reason for not giving me his position.

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.

FACTS ABOUT BAIZE

Editor Textile World Record:

What is the cloth known as "baize"? The following is the description of it found in Cole's Encyclopedia of Dry Goods:

Baize: A coarse woolen material finished with a short, close nap on one side, dyed in plain colors, usually red or green. It is chiefly used for linings, desk and table covers and curtains. Under the name of bay-cloth, baize was manufactured in England as early as 1541, at which time it was a much thinner and finer material than now, being used for men's clothing of the best quality. Formerly the fabric was invariably dyed a brownish-red or bay color, whence the name. I would like more information. Ypres (2421).

Our English correspondent replies as follows:

> Hops, Reformation, bays and beer
> Came into England all in one year.

This would appear to fix the rise of the bays or baize manufacture in England in the year 1536. The date has not been independently confirmed with precision, but in view of other information the broad accuracy of the fact in respect of bays seems probable. The Norwich "Book of Drapery" of 1570 names Bays first among the local manufactures and in 1595 some 10,976 pieces of the goods were exported from England. A passage in a communication of 1578 from the Mayor and Aldermen of Norwich refers to "new inventions of strangers whereof the chiefest are bayes." The Norwich goods of the period were in fact divided into Baytrie or Bailtrie (bays) and Saytrie or Saietrie (Says) and a third sort called Caugeautries. Bays were the specialty of the Norwich Flemings; caugeantries, of the Wallones; and says were more or less common to both. Says were priests' cloths which from the 14th century had been made in England, the manufacture having apparently arrived via Ireland from Catalonia, Spain. About cugeantries it can be said that they appear to have been fancy goods, for "mocadoes, currells, grosgrains, velvets, turteins and the like" were in this class. Baize is generally held to imply cloth of plain weave and open texture, with a worsted warp and woolen filling, teased on one side with a more or less long nap. "A Woollen Stuff, not croise, very loose made with the Hair on one Side, a Kind of Flannel very coarse" is the description given in 1742 in a translation of the Dictionnaire Universel de Commerce. The statement in Cole's Encyclopedia that the fabric was invariably dyed a bay color (whence the name) is contradicted by the personal description given of a disguised priest who made his way into England in 1582. James Lessman, Franciscan friar, was tastefully attired in "a cloak of rat's colour lined with green baize, the cape of tuffed taffeta, red & blue . . . his doublet white & the stockings of his hose of a bluish or murrey colour." Thus there was green baize even at this early date and it is with green that the cloth is mainly associated by those who know the fabric and its connection with furniture. Green baize in England is the orthodox material for covering the bare wood of notice boards in clubs, hotels and schools. Lawyers' offices of the old type invariably had green baize covered doors and the stuff was used too for covering screens and tables. Almost any green fabric or any fabric for tables or doors is "baize" to an upholsterer and what is called "table baize" in the furnishing trade is cotton cloth covered with a linseed oil mixture, plain, or printed in colors. Upholsterers' workmen affect aprons of green baize to a perceptible extent still and the fabric is the orthodox one in which to wrap framed pictures while they are being carried from one house to another.

Baize is known also in another connection. An instance of its use as lining has been given, and Defoe, writing about 1714, spoke of the cloth as one of those of "which the Spaniards carry such vast quantities to America." A Yorkshire manufacturer giving evidence to a parliamentary committee in 1828 mentioned that a great many cotton warp baizes had been exported to South America for a long while. In course of the same inquiry, a Rochdale manufacturer stated that domett, containing a great deal of cotton, had superceded woolen baize. The supersession was not complete, for baizes under the Spanish name of bayetas, dyed in bright colors, are still shipped to South America from mills near Halifax, Yorkshire and in the Rossendale Valley, Lancashire, for use as clothing. Bayetas, frizadas and pellons, as different sorts of the goods are called, are a vanishing remnant of those ancient times, serving at least to demonstrate the continuity of trade history.

The origin of the name baize has never been satisfactorily demonstrated. The suggestion has been thrown out that its origin may be geographical and derived from Baiae, near Naples, but in the absence of anything to link the goods with the place the suggestin can at best be received as a possibility, not as a fact. James Strand.

A NON-CROCKING HEMATINE BLACK

Editor Textile World Record:

We would like a formula for dyeing worsted yarn with Hematine black so it will not crock.

Dyer (2471).

The worsted yarns must be thoroughly scoured and rinsed clean preparatory to being mordanted. The mordant most commonly employed is bichromate of potash and argols, although equally good results are obtained by using lactic acid instead of argols. Mordant as follows, with

2½ lbs. Bichromate of potash.
2 lbs. Argols (crude cream of tartar).

Boil for 1 1/2 hours, lift, rinse well, and dye in a bath containing from 5 to 7 pounds of hematine, adding the dye in several portions as the dyeing progresses, so as not to have too much free color in the bath at any time during the process.

Commence dyeing at 175° F., and proceed at the boil. The color of the bath, when all the dye is taken up should be quite clear. Shading for a full jet black should be done with a small quantity of fustic extract. The fastness of hematine (logwood) dyeing depends on slowness of dyeing, and avoiding overchroming. Wash well after dyeing.

Berwick.

TESTING STARCH

Editor Textile World Record:

I would like some information regarding the testing of starch. We find variations in the quality in different deliveries. What I wish to get is some simple method of testing corn or potato starch so that I can select from sample lots that are practically the same and will give the same results when treated the same way in making size to dress warps. Lockport (2480).

Color should be taken into consideration as dark starch tends to darken the goods. A good way of making a comparison is to lay a pinch of each sample on a sheet of paper, fold the paper over and press so as to flatten out the mound.

If a microscope is available it is advisable to make use of it and to notice the size of the granules. As a practically invariable rule those starches are strongest which have granules of good and uniform dimensions.

If an admixture of mineral adulterant is suspected its presence can be detected by dropping a small quantity of the starch into a tube half-filled with chloroform. After standing a few hours the starch will still be floating and any mineral solid, such as may be added to gain weight, will have sunk to the bottom of the tube.

The consistency of starch can be tested by making paste of two or more samples simultaneously under exactly equal conditions. It is necessary to weigh the quantities upon an accurate balance and to drop each into a measured quantity of water. The test can be carried out easily by employing the requisite number of chemical beakers. (After the starch has been well stirred into the water and cleared of all lumps, the beakers should stand for 15 minutes in a trough of boiling

water. If the trough is heated by flame from beneath, the beakers should stand on a false floor. The mixtures should be stirred all the time and after cooking should be set aside to cool for twelve hours. The strength of the paste can then be determined by tests between the fingers. About seven grammes of starch in 100 cubic centimetres of water is a convenient quantity to take. Percy Bean, who has devoted much attention to the subject, advises that potato starch, after being treated in this manner, should be left for two or three days. Good potato starch will dry up on keeping and the less good will liquefy.

Corn and potato starches are less likely to be adulterated with cheaper starches than are the more expensive wheat, tapioca and sago. Microscopic examination gives the only proof of adulteration in this form.

Samples of starch differ a good deal in their proportion of moisture. The test for moisture is the same as in the case of fibers. An accurately weighed quantity must be reduced to a state of bone dryness in an oven and then be weighed again to ascertain the percentage of lost weight. Wessex.

There is no accurate and simple method for testing starches except the usual one of taking the weighed quantity of each sample of starch, making a thin cream of it with cold water, and then boiling it to make a paste, allowing this to cool, and then passing judgment upon the quality of the starch by the stiffness of the cold paste. To form an opinion by this method requires considerable experience with the large scale working qualities of starches, and consequently it is of little value in the hands of a chemist not practically familiar with starch size making or warp dressing. In the hands of practical mill men very good results are obtained by its use.

An accurate method is based upon viscosity of cold solutions of starch dissolved in caustic soda. The method is as follows: A weighed quantity of each sample of starch is added to 230 ccs. of cold water contained in a flask and shaken until the starch is in complete suspension. Now add 15 ccs. of a 10 per cent. solution of caustic soda from a pipette. Add water to bring up the contents of the flask to 250 cc., and continue shaking at frequent intervals until the starch has completely dissolved, and the solution becomes thick. This will require about two hours, but it is best to allow the flask to remain over night, and test the fluidity in the morning.

Using a viscosimeter to make comparisons of the starch solutions, it becomes only a matter of noting which of the samples flows the slowest, or in other words, takes the longest time for a definite volume of the solution to run out.

Starch solutions cannot be judged by using Twaddle.glasses or other hydrometers. Berwick.

KNITTING SILK PLATED COATS

Editor Textile World Record:

We want to make up a worsted and silk plated knitted garment that can be brushed and will have the appearance of a silk coat with the desired lúster. Can such a coat be made on a five gauge machine, and can it be made with woolen and silk yarns instead of worsted and silk? Also please advise which yarns are best for the purpose and what the cost would be. Knitter (2479).

I think "Knitter" means either a 4 or 6 cut machine instead of a 5 gauge as in this kind of work the cut is mentioned instead of the gauge. A silk plated coat can be made by using silk with very little twist. Have the brushes on the brushing machine very sharp and set at the proper angle, because the machine will draw the silk if it does not cut it. In brushing the goods the backing is liable to show through if the plating is not heavy, and in that case "Knitter" will have to use extra ends to each feed. Be sure and have the cams on the knitting machine ground true and the machine properly adjusted. Delaine.

SPOTS ON VELVET

Editor Textile World Record:

Referring to the question signed (2449) on page 97 of the May issue, I want to suggest that the spots on the velvet can be prevented by having the weaver remove regularly all dust that collects in the reed frame. The reed should be cleaned in the loom with all the shafts either lowered or raised. It is not necessary to remove the reed from the loom. Zaldivar.

FINISHING TWINE

Editor Textile World Record:

What is the best process for finishing fine stitching and mattress twines in both flax and hemp? What ingredients would you consider best in making the starch and at what temperature the drying cylinders should be kept to get the highest polish? Dundee (2482).

Fine stitching and mattress twines are best finished upon a polishing machine of the "Guest" type, made by Thos. Guest, Elton St., Manchester, Eng., a vertical machine in the creel of which the twisting frame bobbins are placed, the ends passed through a size trough, round and between squeezing and feed rollers, spirally round a pair of rollers placed horizontally one above the other and finally rewound upon the winding or spindle, which form the upper part of the machine. In passing spirally around the rollers the threads are brought into repeated contact with the brush cylinder which polishes them, while the air current produced and the friction dries them, except when the size is too heavy, when the rollers are steam heated to a temperature of 280° F. Frictional drying, when possible, is to be preferred, as it gives the best polish. When arranged for steam heat the rollers are 8 inches in diameter, while for frictional drying they are only 4 inches in diameter. The machine is usually made for either 32 or 50 bobbins up to 7 inch lift. The brush cylinder is 24 inches in diameter and 56 inches wide and has 16 brushes and 16 hardwood polishing lags. The brush cylinder is generally run at a speed of from 450 to 500 revolutions per minute. Somewhat similar machines are made by S. McGee & Son, Paisley, Scotland.

A serviceable starch or finish from these twines may be made as follows:

40 gallons (400 lbs.) water.
8 lbs. farina.
¾ lb. castile soap.
2½ lbs. paraffine wax.
3 lbs. bleached palm oil.
1½ lbs. cocoanut oil.
8 lbs. glycerine.

Boil the water and dissolve the soap, then add the other ingredients, except the glycerine, which is added after the rest is well mixed together. Boil hard and quickly, so that the mixture will not run thin. The farina should be steeped 24 hours before using, the water thus used being deducted from the 40 gallons. Boil in a copper trough with copper coil and do not allow the steam to blow directly into the mixture. The size box should be fitted with agitators and these run for three hours after boiling.

H. R. Carter.

ROLLED SELVAGES

Editor Textile World Record:

I am having trouble with rolled selvages on blue denim. The cloth leaves the weave room in good condition and the selvage on both sides is the same. Sometimes the selvage turns over four or five yards from the end of the cut before it leaves the shears, always on the same side of the cloth. The overseer in the cloth rooms claims it is the fault of the loom and I say it is the fault of the shears. I am enclosing a sample of the goods. Sometimes the same cut of cloth goes through the shears all right and the next time it turns as shown in the sample. Can you suggest the cause and remedy? Weaver (2487).

This trouble occurs more or less with all farics that have the selvage ends weaving the same as the body of the cloth. This is because the outside ends are not interlaced with the filling on each pick and, therefore, the outside end on each side is pulled under, causing rolled selvages. The following are probably the most common causes of these defects:

1. Too much power on the shuttle, especially on the side of the loom with shuttle eye at mouth piece of box.

2. Too much tension on filling in shuttle, especially with shuttle on side of loom, as stated in No. 1.

3. Ends of cuts not sewed straight.

4. Cloth expansion roll or spreader not doing its work properly.

There are probably a few other causes, but if the above are given careful attention the number of cuts with rolled selvages will be very much reduced. Frequently a change in the loom from one pick to another will stop the trouble. A change in the drawing-in of the selvage ends, or a change in the timing of the shedding motion may help. The first two causes are self-evident and require no argument to prove that they will cause the trouble. This is especially true when the shuttle eye is at the mouth piece of box because the distance between the selvage and the shuttle eye is short and the outer ends

are pulled in. As for the third cause, it has been found that the operative is usually not as careful with the ends of cuts as he should be. The ends of the cuts should be put on the pins and kept there until the sewing machine has gone over the full width of the cloth.

The cloth expansion roll should be set so that the selvages will be pulled out and the curl taken out of them. "Weaver" states that sometimes the selvage turns over four or five yards from the end of the cut as it leaves the shears. This indicates that the ends of the cuts at the side have not been sewed together straight, that is, the ends of the cuts at that side have been lifted off the pins before the sewing machine has fully passed over the full width of the cloth. On the other hand, it is possible that somewhere near that point the filling had not come from the bobbin freely and had given an extra pull on the selvage with the result that, having once turned under, the selvage remains under to the end of the cut. If the selvage turns under on one side only all through the cut, either the cloth spreaders are badly out of line and poorly set, or there was too much power on one side of the loom.

Wasco.

The probable cause of the curling is tension and it will be advisable to go carefully into the question of the amount of tension given upon the shears. The particulars rendered leave it to be supposed that sometimes the defect does and sometimes does not manifest itself. Does the turning-over occur when the cloth is passed round all the rails, and is it absent when a rail or two are missed? The point can doubtless be cleared up by experiment and it is possible that there is nothing more in the mischief than this.

In consulting the experience of a practical finisher he asked, "Why shear when singeing is quicker, cleaner, better and cheaper?" He would prefer to put the goods across a hot plate stove heated either with coal or oil. The furnace having been set going it costs little more to singe a hundred pieces than to singe ten and the claim of cheapness is founded on the assumption that the stove can be worked continuously. The suggestion is passed on for anything that it may be worth.

Wessex.

STAINING WOOL GOODS

Editor Textile World Record:

Enclosed find two samples of knit goods. One is 3/4 wool and the other 1/8 wool. Can you give me a formula for staining this 1/8 wool sample to make it look like the 3/4 wool for one-half pound of goods?

Seyton (2504).

The 3/4 wool fabric is so much lighter in shade that it will be difficult to stain the other sample to match it without first subjecting it to a bleaching process. By laying the 1/8 wool sample over a sheet of white paper, it is seen to be quite pink in tone, while the 3/4 wool sample is distinctly yellowish. To bring the 1/8 wool sample to match the 3/4 wool goods this pink cast must be overcome. It is doubtful if this can be done by the use of the ordinary tinting dyes without deepening the tone of the finished fabric.

The proper method is to bleach the fabric, and then tint up with a very slight touch of a direct yellow that will at the same time stain the wool.

Dumfries.

SCOURING HALF WOOL HOSIERY

Editor Textile World Record:

Please give us a method for scouring half wool plated hosiery previous to dyeing. We have no scouring machine and have been in the habit of wetting out the goods for half an hour in a weak ammonia bath at 160° F. then rinsing. As the black is not so fast to washing as it should be we thought perhaps our method of scouring might be at fault.

Clinton (2509).

It is my opinion that the scouring solution is too hot at 160° F., as this will make most any black on cotton wash out. It will be necessary to get a small scouring machine for washing 5 to 10 pounds of goods. The bath should be 110° F. The method of scouring is as follows: For 50 gallons of water take 5 pounds of a good palm oil soap and 5 pounds of ammoniated potash. Boil until the soap is all dissolved. This solution is for 100 pounds of goods. Use three pailfuls of the soap and wash the goods 10 minutes in water not over 110° F. Rinse in water the same temperature until the soap is

all out. Then wash again, using 1 1/2 pails of soap in water at the same temperature. Then rinse, taking care that the soap is all out and I think the results will be satisfactory. Gerona.

Good results can be obtained on plated hosiery by scouring in a dolly or laundry machine. We will suppose there is 100 pounds of goods to be scoured. For that amount use one-quarter of a pail of soda to one pailful of soap. Scour for fifteen minutes at 120° F. In the event of "Clinton" not having either of the above-named machines, I would recommend soaking the goods in a bath at 140° F. in the above solution, rinsing well in hot water. Loreto.

MACHINERY REQUIRED FOR SPINNING COTTON YARN

Editor Textile World Record:

How many spindles would be required to spin 1,000 pounds 24s and 30s cotton yarn per day of ten hours. Would it make any difference if we should spin 1,000 pounds 26s yarn instead of 24s? How much per spindle would it cost to equip a room in our present mill with the necessary machinery for mule spinning this quantity of yarn?

Shanghai (2505).

The same lay-out can be made for both 26s and 30s yarn up to the spinning frames. Then on the spinning frames the draft can be changed in order to produce either size of yarn required. More spindles will be required for the finer yarn than for the coarser yarn. Hence in making the calculation for the required number of spindles, if the number of spinning spindles required for the 30s yarn is ascertained, there will be no difficulty in changing from 26s to 24s. If only one calculation is made and that for 30s, then the number of spindles will be in excess of the number required when 24s yarn is being spun. In that case about 10,000 spindles would be required, calculating that each spindle will produce .20 pound per day of ten hours, and using 2,000 pounds of cotton roving on the spinning frames per day.

Assuming a constant production of 1,000 pounds per day of each size, then 5,000 spindles will be required for the 30s yarn and about 4,500 spindles for the 26s, making a total of 9,500 spindles.

In arranging for the size of frames for this number of spindles, the width of the room would be a determining factor since spinning frames are generally set across the width of the mill.

Following is the lay-out of hanks and drafts. There is no hard and fast rule to determine these points, each overseer or superintendent making the lay-out to suit his own ideas:

Machine		Hanks	Draft
Speeder		6.00	6.5
Intermediate		1.84	5.5
Slubber		.67	4.5
2nd Drawing frame	grs.	56½	6.0
1st Drawing frame	grs.	56½	6.00
Card	grs.	56½	100.00

13½ ounce lap.

The amount of waste made in the various processes throughout the mill cannot be estimated closely unless the exact grade of cotton is known. Even then there are so many variable elements entering into consideration that only an approximate amount can be named. The amount of stock used will be as follows: Spinning, 2,000 pounds; speeder, 2,040 pounds; intermediate, 2,080 pounds; slubber, 2,140 pounds; drawing, 2,200 pounds; cards, 2,250 pounds. To produce this material the following equipment can be used:

Mule spindles		9,450
Speeder spindles		1,658
Intermediate spindles		360
Slubber spindles		134
Drawing frames	deliveries	12
Two processes or	deliveries	24
Cards		15

The approximate cost of these machines is as follows, though it must be remembered that the price of machinery varies at different times:

One breaker lapper with automatic feed	$1,200
One intermediate picker	750
One finisher lapper	750
15 Cards at $550	8,250
24 deliveries of drawing at $75 per delivery	1,800
134 slubber spindles at $12.50 per spindle	1,675
360 Intermediate spindles at $9.25 per spindle	3,330
1,658 Speeder spindles at $6.25	10,362
9,450 Spinning spindles at $3.00	28,350
Total cost of machinery	$56,467

In addition to this cost there will be additional supplies which will have to be purchased, such as extra rolls, skewers, bobbins, can, trucks, etc. Shafting hangers, pulleys,

belting and power plant will also have to be added to the cost. These costs are variable depending upon the style of motive power used. Wasco.

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DRAFT FOR WEAVING

Editor Textile World Record:

We would like some information in regard to Indian robes woven on an ordinary Crompton & Knowles loom. We have through your valuable Textile Directory come in touch with firms making Indian robes. To these firms we have sent colored designs, made one-seventh the size of the original robe, and they now wish us to give them a layout for the weaving, which is to consist of a drawing-in draft and a harness chain draft for ordinary Knowles looms. It is this information we would like to have you give us. While we are thoroughly familiar with making the drafts for silk and cotton weaving in its different branches, including dobby weaves, we think we can easily work into this new branch if you can give us the necessary information. Weaver (2502).

The preparation of the drawing-in and weave drafts for Indian robes to be woven on a harness loom, is based on the same principles as are employed in making drawing-in and weave drafts for other woven fabrics, including silk and cotton. A draft prepared in the usual form would be understood by the firms with which "Weaver" is in correspondence in regard to Indian robes

Instructions for preparing drawing-in and weave drafts were given in the July, 1911, issue of the Handbook of Weaves. The designing of the pattern depends upon the effect desired and for this work it would be impossible to give any definite instructions, as each pattern presents its own peculiar problem.

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HAMMOCK FRINGE MACHINERY

Editor Textile World Record:

Can you give me the names of firms who manufacture machinery for making fringe for hammocks like sample enclosed?

Manufacturer (2508).

Enquiries fail to elicit the name of any English maker of such machines as required and certain machinists who might be disposed to take up the problem seriously have their hands full for an indefinite period ahead. There has been a demand for a fringe-knotting machine for a long time and, quite against their wills, manufacturers of fringed woven cloths have had to employ large numbers of girls to knot the fringes together. In a known case a manufacturer had to open special premises twenty miles away from the mill in order to obtain the requisite female labor. The point is mentioned as proof of the reality of the demand for machinery for the purpose. In case of need the names could be furnished of English firms who have sought for a suitable machine and would be interested in a new one. J. Strand.

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BROKEN ENDS IN SPINNING

Editor Textile World Record:

Please inform me how I can prevent the ends from coming down on a worsted spinning frame when the machine is started up after standing over night or during the noon hour. The section consists of cap frames running on warp bobbins, the stock being 1/2 blood spun to 24s to 40s. Everything seems to be in good order, the caps are clean, the machine starts very smoothly. The roll which has been giving trouble has been refluted in the machine shop, and it has occurred to me that the breakage is caused by poor work in refluting, causing the ends to break after the machine stands for several hours.

Wyman (2498).

If all the other conditions are the same as before the rollers were refluted, and if the fault has only developed since they came back from the machine shop, the cause of the trouble is easily explained. Either the flutes have been cut too deep, leaving the edges of flute rather rough, or the spinner has overlooked the fact that newly fluted rollers require very little pressure upon the springs to get the amount of grip required for a good draw. Refluting not only makes the grip keener, requiring less pressure, but also saves power. A wad of cloth enclosed in a piece of fine emery cloth, pressed between roller and back of the top-board, will soon clear off all the rough edges.

Another cause of ends breaking when the frame is started is having the drag too keen. This is sometimes caused by the caps being too large, increasing the tension, especially when the frame is starting. The frame should never be stopped when the lifter is at the bottom, especially when using heavy warp bobbins. If the mistake has been made of having the flutes cut at equal distances, thus tending to make ridges on top rollers, the only cure is to have the rollers refaced and the cuts made at irregular distances.

John Brown.

Knitting Department

KNIT GOODS SITUATION

Duplicate fall orders have not been coming in to the full satisfaction of manufacturers, but there are no departments in any of the jobbing houses that are anticipating their wants very far ahead. The manufacturers may have to be satisfied for the present with the small orders they receive. The trouble with a good many manufacturers is that they do not realize fully that they are as necessary to the jobber as the jobber is to them. They are especially necessary individually to the very large operator, as he cannot confine his purchases to any one mill. He must divide the orders so as to be sure of getting a fair quantity of merchandise for early delivery.

The reductions that the manufacturers made early for next spring season did not bring any more orders than they would have received at an advance of a few cents a dozen. This small increase would have been a profit to the manufacturer and no loss to the jobber.

Some manufacturers are prone to take the wrong view of a jobber. They seem to feel that he is the cause of bringing prices down, whereas in most instances it is the manufacturer's fault. Jobbers do not know the cost of making merchandise, and the manufacturer when he sends his salesman on the road does not give the salesman confidence in the line he is carrying. He leads him to believe he can meet competition or that the manufacturer will meet it. The moment a lower price is suggested by a competing manufacturer, the salesman immediately takes it for granted that it is a fact and wants his manufacturer to meet the price suggested. This goes on from bad to worse until there is no profit left to the manufacturer. A jobber cannot be blamed for not operating if the men who offer the goods have not full confidence in the prices they are asking and in the merchandise they are offering.

Manufacturers of low grade balbriggans have advanced their price five cents a dozen. At the recent meeting of the manufacturers, which was a very satisfactory one, the aim was to create a better feeling among competing mills. This, if accomplished, will be one of great service to the trade.

HOSIERY

The main demand still centers on fiber hosiery. All the manufacturers are sold far ahead and no goods are to be had for nearby delivery. The fiber has advanced materially during the last few weeks and the prices at which manufacturers have sold most of their production for spring leaves but a small margin of profit unless the mills are fully covered on material. Where the manufacturer is making both the 25 and 50 cent lines, he naturally is putting more energy in the 50 cent line, which shows him a fair margin of profit. Before long the buyers will be satisfied with a low grade thread silk, which has been out of the market for some time on account of the fiber being much more sightly than the thread or tram used for cheaper silk hose. Some jobbers and direct selling agents are so short on 25-cent numbers, they are writing various mills direct, making attractive offers for prompt delivery.

SWEATER COATS

The demand still continues very strong on ladies' silk coats, and it looks as though it would continue for some time to come. On account of the high price of the good coats, some jobbers are putting these in their ready-to-wear departments, where garments are sold by the piece and not by the dozen.

The best selling styles are those with the wide sashes. Where people have silk coats without sashes, they are ordering sashes so as to make the coats up-to-date. In the wool and worsted coats they are now making sashes and selling them separate so that the people who have coats on hand without belts or sashes, can put their stock in selling condition.

The export business continues, but not in decreased volume, especially on war supplies. The export on ladies' 25 cent silk hose was of fair proportions before the war, but the manufacturers are not looking for any outside business on this line, as they cannot take care of their home consumption.

There has been little or no demand for wool hosiery. It is possible that to a great extent this has been affected by home knitting, as, for the past year, all over the world women have been knitting socks for soldiers.

CAUSES OF CLOUDY WORK IN WORSTED KNIT GOODS

BY BRADMORE

A sample of faulty knit goods was submitted for examination a short time ago. It seemed to be full of irregularities—not exactly streaky, or thick and thin in courses, but more of a marbled effect. Fig. 1 gives some idea of its appearance when held up to the light. The heavy and light parts were so irregular that at first sight it looked as if the fault lay, not in the yarn, but in the knitting frame. On closer examination, however, both the tension and the stitches were found to be in proper order. The fabric was then unraveled to show whether only one thread had been running in the light parts. It was found that both threads were there, and unbroken.

Then the threads as taken from the sock, were carefully wound on a blackboard side by side. The yarn was seen to be not only uneven, twitty and different in twist, but so carelessly spun as apparently to vary several counts in the thickness. In some places the thick part ran for a yard and upwards, then thin places followed, while other parts of the same thread seemed to be so overdrawn as to be at the breaking point. In one of the threads a bad place shows about every twelve inches. It would be hard to find so many different faults in so small a sample. As a proof that good wool had been partly used in the blend, the thread was fairly elastic and resilient and stood a fair breaking test. If the two ends had been twisted together some of the faults would be reduced, but not entirely cured.

Fig. 2. is a sample taken at random, both ends being wound at the same time.

On dissecting the yarn it is found to contain a small proportion of good, sound, shafty wool. The stock has been well combed and finished, and is practically free from the neps, slubs and cut work. There is, however, a preponderance of short wool, and altogether the quality is fine, there is not enough long-stapled wool in it to draw out to so fine a count.

In working stock made from a blend with so much short wool in it, great care must be

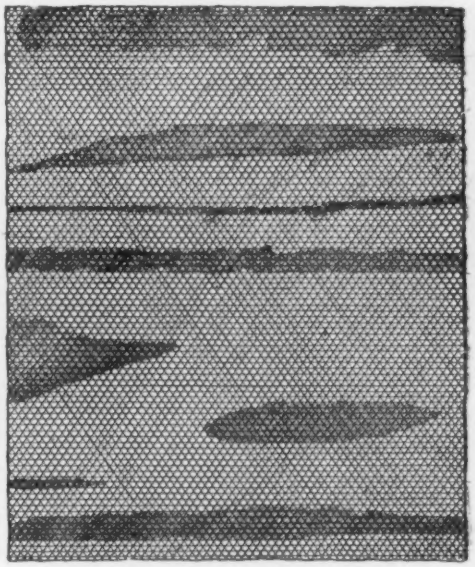


FIG. 1. SHOWING IRREGULARITIES IN A SAMPLE OF KNIT GOODS WHEN HELD UP TO THE LIGHT

taken not to overdraft, especially in the earlier stages of drawing. There are many indications that the sample has suffered both from too heavy a draft and from too long ratches in the boxes following the gills. This accounts for what may be termed the unequal unevenness in the final spinning operation. If an extra box had been used in the drawing, and the drafts and ratches shortened proportionately this fault would have been partly avoided. Although the aggregate draft may have been normal, excessive drafts in the earlier stages, and a reduced draft at the weigh boxes to bring the

slivers to the required weight have a tendency to cause unevenness.

In some of the threads there is evidence that the leather covering of the top roller has been loose, as about every fourteen inches there is a badly drawn part. Wherever hard, leather covered rollers are used, they should be carefully examined at regular intervals. As soon as the glue gives way, or there are signs of grooving, the roller must be taken out and replaced. Careless piecings, and the neglect to take out piecings after they have passed the front roller, especially in boxes which have no gills, also cause these faults in the yarn. In the later drawing boxes where the ends are not spliced as soon as the running-out end leaves the back roller, the carriers have not pressure enough to hold it and the result is a "slur" followed by a thin place.

Some portions of the sample submitted show variations in the twist. This can be caused either by slack bands, or neglect to oil the spindles. A slack band in the roving box or a band that has run so long that it has lost its elasticity will cause a bad place which is increased in length considerably in the spinning. When worked into fine goods this easily produces the heavy effect which is so prominent in the sample. In other parts the twist is too hard. This has been caused by a careless minder not taking out the thin part where only one end has been running in the roving box. Any slight difference in the twist where two ends are run side by side is sure to show when the goods are scoured, owing to the difference in the shrinkage. Running old and new yarn side by side has a tendency in the same direction.

FIG. 2. SOME OF THE YARN USED IN THE SAMPLE OF KNIT GOODS

The main faults seem to be using too much short wool in the blend, too much dependency on the quality, and too rapid a reduction by drafting from the top to the roving. The defects might have been avoided by shorter drafts and the running of fewer ends up the backs of boxes in the earlier processes. This means a much re-

duced output. Of the two remedies, an extra process in the drawing is the best solution of the difficulty.

A STRAIGHT HOSIERY FRAME

A straight hosiery frame provided with means of retarding the speed of the thread guides has recently been patented in this country and is described by the inventor as follows: The object of these improvements is to provide stop or retarding mechanism which can more easily be mounted on the frame than levers and the like and which frequently can not be provided in the frames because they require too much space, so that the size of the machine must be increased in order to prevent the levers from interfering with other parts of the machine. The invention consists in providing gear wheels and racks in combination with the stop members, which can be mounted at any desired place of the machine between the rod for retarding the thread guide and the slur connecting bar, and which do not interfere with other mechanism and require little space.

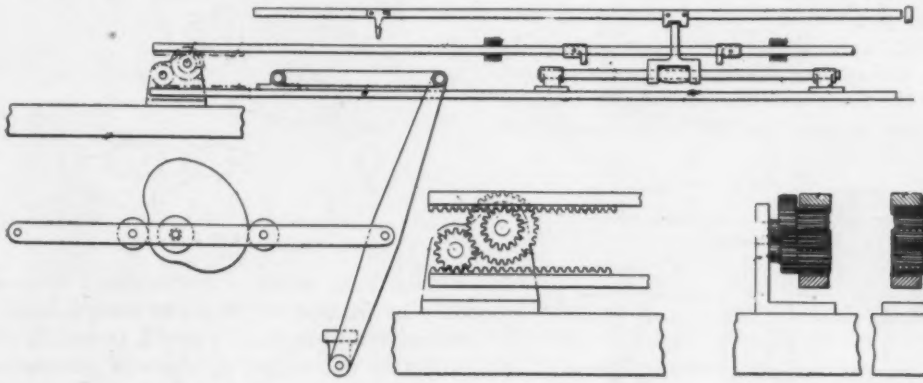


FIG. 1

FIG. 2

FIG. 3

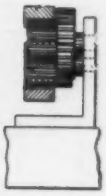


FIG. 4

Fig. 1 is a front view of the mechanism and the parts cooperating therewith; Fig. 2 is an enlarged detail view; Fig. 3 is a side view of Fig. 2 seen from the left, and Fig. 4 is a similar side view of Fig. 2 seen from the right.

The hosiery frame is provided with a slur connecting bar of usual construction, which is adapted to be reciprocated from a knitting cam through the intermediary of a rod, a rocking knitting lever, and a connecting rod. The member for carrying along the thread guide bar provided with a thread guide is mounted on the bar. This member consists of a bar secured to brackets mounted on the bar. The bar is frictionally engaged by an arm which is adapted to carry along the thread guide bar. The carrying mechanism depends upon the movement of the knitting mechanism, and the same speed is imparted to it as to the knitting mechanism.

The improved retarding mechanism connected with the knitting mechanism is constructed as follows: The slur connecting bar is provided at one of its ends with rack teeth. On the frame of the machine a bracket is mounted which provides a support for short shafts on which gear wheels are mounted. The gear wheel which is mounted on the axis is in mesh with the rack teeth of the bar. The gear wheels which are mounted on the axis are rigidly connected with each other, and are of different diameters. One small gear wheel is in mesh, while the other small gear wheel is in mesh with rack teeth of a rod, which is mounted for reciprocation in suitable bearings. The movement of the slur connecting bar is transmitted through the rack and the gear wheels to a rod which forms a part of the retarding mechanism of the thread guide. The number of the teeth of the larger gear wheel is the double of that of the teeth of the smaller gear wheel, so that the velocity

of the thread guide retarding rod is only one-half of that of the bar. The retarding members are overtaken by the arm of the thread guide bar prior to the end of the thread guide. Thereupon the thread guide bar is retarded, because it must assume the speed of the rod until the thread guides arrive at the end of the stroke which is determined by the stop. This is possible because the thread guide carrying arm is adapted to slide on the rod, the speed of which is not retarded.

FANCY HOSIERY ON FULL FASHIONED MACHINES

BY LIGNY

A short time ago, when stripes were becoming popular, I received an ingrain silk stocking, a stocking knit from dyed silk, which looked like a zebra. The upper part above the knee was one solid color. Below the knee to the toe was a succession of

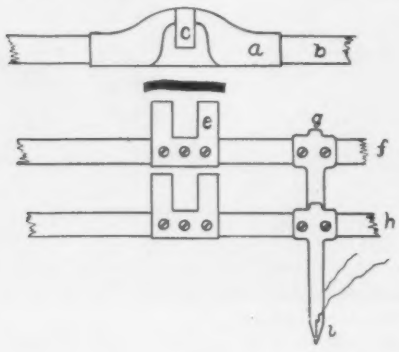


FIG. 1

stripes, one Copenhagen blue and the next sand. The width of the stripes varied according to the pattern desired. The entire hose was silk and was sold to the trade at a price just calculated to keep the machines in operation. It occurred to me that it need not be made in the ingrain, that if silk and mercerized yarn were used in the alternate stripes the dyer could in one bath bring out the two colors as desired. I tried it and produced a stocking that compared favorably with the all silk ingrain and which sold at a lower price, with a much lower cost of production. I introduced it as "two tone hosiery" and it proved very popular. A large quantity of hosiery was made with mercerized tops and silk boots, dyed in two shades as desired. The top would be one color, the boot another.

The first thing to be considered was an attachment to produce the stripes which would not be too expensive. A shows a

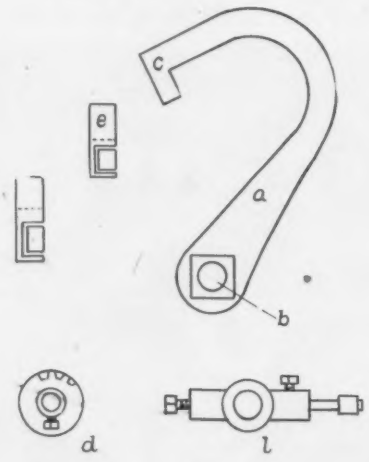


FIG. 2

friction box, which is reciprocated horizontally by friction rod, b. The nose, c, shown out of action in Figs. 1 and 2, is held in position by the collar, d, which is fastened at one end of the rod b. It has three slots filed as shown, into which a flat spring with one v-shaped end presses into one slot. When moved to first position this is placed in the open lock, e, on carrier rod, f, causing the yarn carrier, g, to be moved into action. When desired, the friction box is moved to the next position, bringing the nose, c, into the open lock of carrier rod, h, when carrier, i, will be brought into action. The yarn carriers, g and i, stand immediately back of each other at the end where the change takes place, so as to bring both carrier locks perfectly even to allow the nose, c, to work properly.

Fig. 3 shows the changing device. A swivel cam, j, is held in the up or down positions by a push spring, k, with a rivet in the end which presses on the end of the cam. This is fastened on the opposite end of friction rod, b, to the collar, d, and is in

the position shown at Fig. 5, which is a side view of Fig. 3. M is a roller on the end of the pin and at the first movement of friction box, a, faces the lower opening of changer. N is a shaft against which the changer is held by the spring, o, in which position the roller, m, cannot come into contact with the changer until p is forced up between the shaft and changer by the high link on chain seen in Fig. 4 which shows p loosely hinged at q.

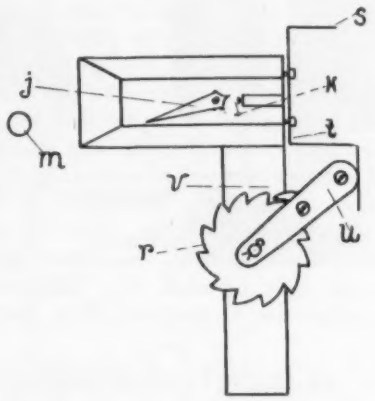


FIG. 3

This chain wheel is pinned to a shaft which passes through the changer to the other side where a rack wheel, r, Fig. 3, is also pinned to the same shaft and is operated

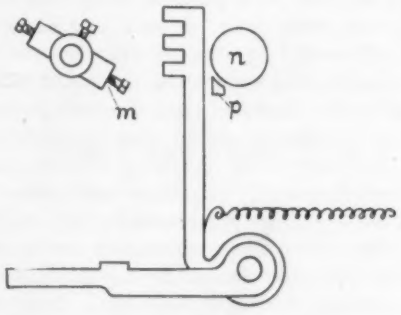


FIG. 5

by an arm loosely placed on the hub of the wheel and kept on by a cotter pin as shown. The extreme end of this rack level rests against a stop arm, s, so-called because when the rack level is moved towards the left, the arm, s, can be forced down until the elbow, t, comes down in front of the rack arm keeping it from returning to its original position and so stopping the changer.

A pin, U, Fig. 3, projects from rack lever. As the slur bar or slide which reciprocates and moves the friction rod, b, is near the end of movement to left, another projection fastened on it comes into contact with the rack lever projection and moves it along when rack lever pawl, V, meshes in the teeth of

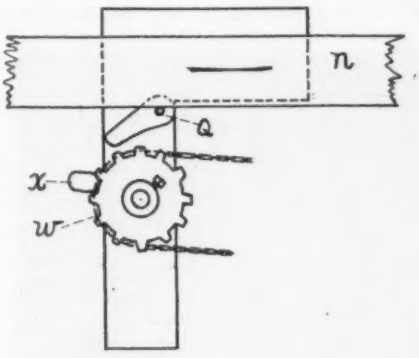


FIG. 4

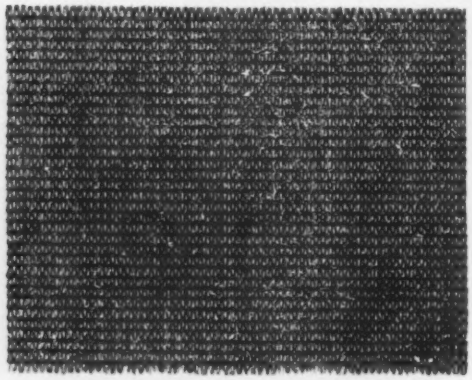
rack wheel, r, moving it one tooth and so racking the chain wheel until the high link comes into contact with lever, p. This forces the changer out and brings roller, m, in line with this slot. As roller, m, is returning from the left to the right it runs in the open space of the changer, Fig. 3, up the swivel cam, j. As roller reaches the top of the cam, the latter is forced down at that point which reverses its position. The spring, k, holds the cam in its new position and as the roller passes out, snaps the long part of the cam against the changer.

When the roller, m, moves to the left again the rack lever is moved, causing the high link, x, to pass the lever, p, allowing it to fall. This causes the changer to fall back against the shaft, n, allowing the yarn in the carrier, i, to be used until another high link in the chain brings the changer into action again. This causes the roller, m, to run down the swivel cam, bringing to its original position and changes the friction box from carrier rod, p, to carrier rod, j.

A FABRIC FOR HOSIERY AND UNDERWEAR

The fabric shown in the illustration is manufactured by a process recently patented in this country and which is described by the inventor as follows:

The fabric is composed of white thread silk in the gum (also known as Japan tram, natural silk, and pure silk) twisted together with either white artificial silk thread (made from woody fibers or cellulose in the usual manner) or white cotton thread and then knitted or woven to form the fabric into a



A FABRIC FOR HOSIERY AND UNDERWEAR

sock, stocking, undergarment, necktie, etc., after which the fabric is boiled in a soap bath to remove the gum from the thread silk. After degumming, the fabric is then dyed by using a combination of dyestuffs and chemicals that will dye the artificial silk or the cotton but not thread silk. While the fabric is being dyed, a small percentage of dye does go on the thread silk, but this is removed by boiling the fabric after dyeing, which strips the dye from the thread silk and restores the color back to the natural white, leaving only the artificial silk or the cotton the color of the dye. By reason of the fabric being formed of thread silk twisted together with either artificial silk thread or cotton thread and then knitted or woven, the thread silk and the artificial silk or the cotton become interspersed irregularly throughout the fabric. The dyeing of the material in the manner described results in the production of a fabric having a mottled appearance because of the presence of the interspersed white fibers of the thread silk and the colored fibers of the artificial silk or the cotton in the fabric.

In practice, various dyestuffs may be used to color the artificial silk or the cotton different colors and still leave the thread white. For example, if it is desired to dye the artificial silk or the cotton black, sulfur black dye consisting of sulfide of sodium, sulfur black, glue, and salt is employed. These dyes will dye the artificial silk or the cotton but not the thread silk, the glue being used to prevent the sulfide of sodium from eating up the thread silk. In order to dye the artificial silk or the cotton tan or navy blue, tan or navy blue coloring matter and phosphate of sodium may be used so as to color the artificial silk or the cotton tan or navy blue and leave the thread silk white. It should be understood that dyes other than black, tan, or navy blue may be used, and, furthermore, basic colors may be combined if so desired.

AN IMPROVED STOCKING

The illustrations show the construction of a stocking, recently patented in this country. The part of the stocking at the toe is perforated, while the other portion may be of any desired texture.

Fig. 1 is a plan of the stocking; Fig. 2 is a sectional side view; Fig. 3 is an enlarged detail, in plan, of a portion of the stocking.

The stocking may be knit in tubular or full-fashioned. At a point over the toes of the wearer is an openwork section, 2, which is knit with a series of spaced openings made relatively large to permit free circulation of air. The openwork section is shown across the top portion of the hose and along its sides to a point approximating or slightly above the sole. The openings in section permit the free circulation of air downwardly and laterally through the holes. The ventilated or porous section may be made united with the remainder of the hose by knitting the hose in a single piece.

The hose is shown provided with the reinforced toe portion, 3, back of which is the ventilated or porous section, 2, secured at its forward edge to the rear edge of portion

3. Back of the section, 2, is a reinforced portion, 4, secured at its forward edge to the rearward edge of section, 2, and having its rear edge secured to the ordinary knitting, 5, over the instep portion. The sole is shown reinforced and united integrally with the reinforced portions, 3 and 4, the porous section, 2, at its ends, and the ordinary knitted portion, 5.

FIG. 3

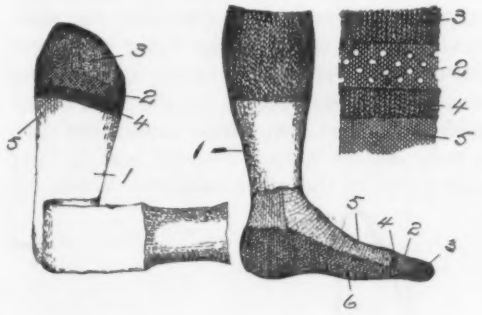


FIG. 1 FIG. 2

By means of the improvements a stocking having the ordinary requirements for strength is provided with the advantage of the open or porous section, 2, located as described, whereby the strength of the sock or stocking for use is maintained. By means of the reinforced section, 4, interposed between the openwork section, 2, and the main portion, 5, the desired strength between the latter section and the toe is provided, notwithstanding the very open or porous like section, 2, interposed at the top of the forward portion of the stocking or sock.

LADIES' NEW UNION SUITS

An improved union suit is now being put on the market in this country. This garment was patented in Canada and the United States by D. C. Collier of Barnesville, Ga. J. R. Moodie & Sons, Ltd., of Hamilton, Canada, manufacture this union suit in Canada on a royalty basis. The Collier Mfg. Co., Barnesville, Ga., have been manufacturing this garment in all qualities. Clift & Goodrich, New York, sell the production of the mill.

In addition to the above mills there are several other American knitting mills that will manufacture this patented suit on royalty.

MIXED EFFECTS ON YARN, HOSIERY AND CLOTH

A German process for producing mixed effects in textile goods has recently been patented in this country, and is described by the inventor as follows: Out of loose wool and cotton yarn may be spun and such yarn dyed in different colors. The product thereby obtained is called "melange." Differently dyed threads may be twined together and that the yarn thereby obtained is called "jaspe."

According to the present invention two different threads, for example, undyed wool and undyed cotton, preferably four or manyfold, are twined together in a raw state and then dyed say in a bath of a wool dye. By this process an effect is obtained which neither presents the indistinct feature of the "melange" nor that of the "jaspe," but produces quite a new and special impression, a color effect lying between that of the two aforesaid methods.

The product obtained by the new process which might perhaps be termed "jaspe-melange," shows sharper and more regular outlines than the "melange," but, on the other hand, it presents when compared with the real "jaspe," a more melange-like character.

In one or more fine yarns of undyed cotton and one or more threads of undyed wool may be used to produce a ply thread. After which two or more of these ply threads are twisted together to produce a compound thread. This is not to be confused with a known process in which two or more wool yarns are twisted together to produce a wool thread, and this wool thread twisted with a similar thread of cotton material, nor is it to be confused with the process in which yarns are made from a mixture of wool and cotton, which are twisted together to produce compound threads. This thread is now dyed, say with wool blue, whereby the wool will be thoroughly dyed blue, while the cotton takes only a very light shade of

color. The dyed thread may thereafter be dyed, for example in chamois, whereby the cotton becomes thoroughly dyed, whereas the wool, previously dyed blue, will take only a little shading.

By this process the effects of the two colors will influence each other in such a manner that beautiful transition-colors, not obtainable in any other way, will result and produce superior "melange" effects. The most different colors may be combined by this system, so as to produce the most varying melange-shades.

UNEVEN KNITTING

Editor Textile World Record:

I am enclosing two samples of knit goods made on a circular latch needle machine. We are running the worsted and cotton yarn from the cones through the stop motions. These samples are made from 8 cones of worsted and 8 cones of cotton, plaiting the two threads. One of the samples is bleached a little, while the other is unbleached. What I want to know is why the worsted yarn does not cover all the cotton yarn the way it should. There is a tension on the cotton yarn and when the machine is running or is turned by hand the cotton thread cannot be seen crossing the worsted yarn. Knitter (2514).

I have examined the two samples of knit fabric and have come to the conclusion that the trouble is caused by one of three things: First, you are probably using too much tension; use no tension; running the yarn, either cotton or worsted, from cones through the stop motion gives enough tension to lay the yarn out straight. Second, the long streaks of cotton showing on the face might mean cuts in the hole of the yarn carrier. The wear of the yarn going through the carrier will sometimes cut a groove through the hole which jerks and slacks the yarn while running, and thereby throws the yarn either to the front or back. Any other rough place that the yarn might touch would also cause the same effect. Third, be sure that the yarn carriers or guides do not touch the needles either at the top or bottom. Give plenty of room for the cylinder needle latches to close freely. A short stitch cam in the dial will sometimes let the dial latches close too quickly, rolling the yarn on needles either way and thereby throwing the yarn to the front or back of the fabric. Again the holes in the thread guide might be high or low, or the plating hole too far away for the yarn to lay even. A plating hole too close to the center will let the yarns run too close together, thereby causing long streaks of back yarn to show on the front, as in the samples submitted. When the holes are too close together, which can be determined by turning the frame by hand, the threads will not lay even on the needles.

Cymbal.

I find after carefully examining the samples of knit goods that the cause of uneven plating is probably due to the guide being too close to the needles or the hole in the guide being too low, which causes the yarn to roll. I have always found it best to have both yarns of the same tension. When the

FIG. 1

cylinder needles are drawing down it is best to have the yarn lay right back of the rivet on the dial needle. Fig. 1 shows a plating guide which I find gives good results. When knitting worsted and cotton we run from cones; when knitting worsted and silk we wind the silk. Garnier.

About 4,550 years ago the Empress Si Ling Chi was walking in the gardens surrounding her palace when her attention was attracted by a small, ugly green worm feeding upon the leaves of a mulberry tree. Day after day she returned to watch it as it grew to maturity, when it finally spun a silken body. At the suggestion of the Emperor Hoang Ti she took the cocoon, disentangled the filament and wove therefrom the first silk fabric.

Dyeing, Bleaching, Finishing, Etc.

COMMERCIAL ALKALIES, THEIR STRENGTH AND VALUATION

BY KASHGAR

The question of the strengths of alkalies and their practical money value to the mill man is one of almost perennial resurrection. It seems that the volumes of technical information published has had no effect whatever upon the users of such commodities, so far as setting them straight in the matter of such supplies is concerned.

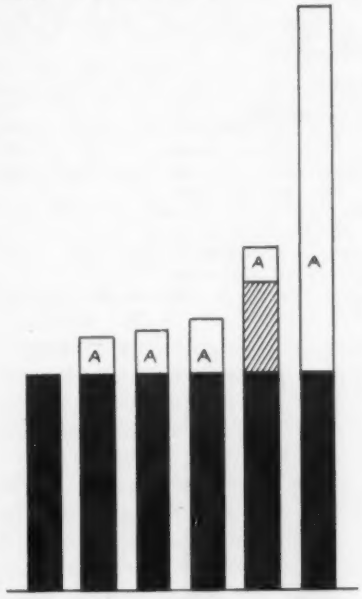


FIG. 1

The chief carbonated alkalies used in textile mills are sal soda, monohydrated carbonate of soda, two kinds of soda ash, 58 and 48 per cent, respectively, sesqui carbonate of soda, and seldom, bicarbonate of soda. Briefly, soda ash is the product of the old Leblanc process, and which possibly supplies one-half of the world's consumption of that article, the other half being obtained from the Solvay process. The Leblanc "58 per cent." ash is nearly pure carbonate of soda, but always contains unavoidable, though small quantities of impurities that for some purposes are objectionable. These impurities in this particular soda consist chiefly of lime salts, though frequently, iron is found in such quantities as to prevent its use in certain instances. On the other hand, Solvay ash of corresponding strength is practically free from such impurities, due to an entirely different process of manufacturing, and consequently, other things being equal, is to be preferred for textile mill work.

Leblanc ash is the product of a process that now must depend upon its yield of chlorine for a profit, and which is the sole reason why it survives. As soon as the electrolytic processes are further developed it will be only a matter of time when they will cause a total suspension of the activities of the Leblanc process.

"Fifty-eight per cent." soda ash is so-called because it contains that amount of oxide of sodium (Na O) in the form of carbonate. Every 100 pounds of pure dry carbonate of soda (100 per cent. Na O) can contain no more oxide of sodium than 58 per cent., consequently the commercial article has been designated "58 per cent. ash."

Regarding "48 per cent." ash, this is correspondingly weaker in its content of sodium oxide, than the "58 per cent." ash, the difference being made up by a quantity of impurities amounting to about 17 per cent. and usually consisting of undecomposed salt or sulphate of soda, with small quantities of other substances.

Sal soda is a crystallized product obtained by dissolving soda ash in water, allowing all the insoluble matter to settle out, and evaporating the clear solution sufficiently, then allowing the crystals to form, when they are fished out, drained, and packed.

Monohydrated carbonate of soda, a product of several processes, is a very pure form of soda that is not as strong in alkali

as soda ash, but very much stronger than sal soda. This form of soda appeared on the market years ago as "concentrated sal soda" and has occupied an important position as a textile scouring agent ever since.

Sesquicarbonate of soda is a form of soda produced by a special process and finds a very extended use in textile work.

Regarding the value of alkalies, that is the carbonated soda compounds, it is to be noted that whatever the strength indicated, it is always referred to in terms of "oxide of sodium," or as the chemist writes it, Na_2O, and this can be plainly seen in connection with "58 per cent." ash which is nearly all carbonate of soda. The "58" means that in 100 parts of pure carbonate of soda there is sufficient sodium, if converted into oxide to amount to 58 parts. As a matter of fact 58 parts of oxide of sodium correspond to 100 parts of carbonate. As to the "48 per cent." ash, the same explanation holds, 100 parts of this grade of ash contain 48 per cent. of oxide of sodium, which, if converted into carbonate will produce a maximum of only 82.2 parts of carbonate of soda, leaving 17.8 parts to be made up of something other than soda, and which is generally undecomposed salt and sulphate of soda.

To make plain the efficiency values of the various sodas in relation to "58 percent soda ash" which is taken as the standard, reference is made to the accompanying diagrams. Fig. 1 shows the actual weights of the different sodas corresponding to 100 pounds of 58 per cent. ash, and which are as follows:

100 pounds of "58 per cent. Soda Ash."
116.9 pounds of Monohydrated soda.
121 pounds of "48 per cent. Soda Ash."
124.8 pounds of Sesquicarbonate of soda.
158.4 pounds of Bicarbonate of Soda.
269.8 pounds of Sal Soda.

The black portion of each indicates pure sodium carbonate, the portion marked "A" represents moisture or impurities, while the shaded portion of No. 5 represents the carbonic oxide in excess of the proper amount to form sodium carbonate.

In each of the quantities of the several items indicated in the above table, there is exactly 100 pounds of carbonate of soda.

Referring now to Fig. 2, we have here equal weights of the several products in the same order, with their constituents shown. In this diagram, however, the black portion denotes "oxide of sodium," the shaded portion denotes carbon dioxide, which, if combined with the sodium oxide would complete

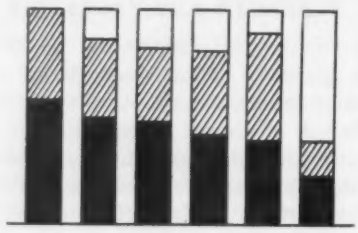


FIG. 2

the amount of true carbonate of soda, while the unshaded portion denotes water of crystallization.

100 pounds "58 per cent. Soda Ash" contains 58 pounds sodium oxide.
100 pounds Monohydrated soda contains 49.6 pounds sodium oxide.
100 pounds "48 per cent. Soda Ash" contains 48 pounds sodium oxide.
100 pounds Sesquicarbonate of soda contains 41.5 pounds sodium oxide.
100 pounds Bicarbonate of soda contains 37 pounds sodium oxide.
100 pounds Sal Soda contains 21.4 pounds sodium oxide.

Fig. 3 is a graphic representation of the amount in pounds of each soda procurable

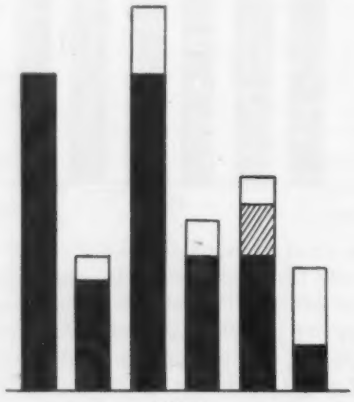


FIG. 3

for a dollar—a dollar's worth of each at current (November 25th) prices for bulk lots, from which we learn that one dollar will buy respectively

147 pounds of "58 per cent. Soda Ash.
62 pounds of Monohydrated Soda.
178 pounds of "48 per cent. Soda Ash."
80 pounds of Sesquicarbonate of Soda.
100 pounds of Bicarbonate of Soda.
57 pounds of Sal Soda.

but if this diagram is further examined, we must pay close attention to the black portion which indicates the real scouring value, viz: carbonate of soda—of each of the items, and which are:

147 pounds "58 per cent. Soda Ash" or 100 per cent. real carbonate of soda.
51¾ pounds Monohydrated soda or 35.2 per cent.
147 pounds "48 per cent. Soda Ash or 100 per cent.
64 pounds Sesquicarbonate of Soda or 43.5 per cent.
64 pounds Bicarbonate of soda or 43.5 per cent.
21 pounds Sal Soda or 14.28 per cent.

from which it is seen that 58 per cent. soda ash is the cheapest (48 per cent. ash being equal, but less desirable), while sal soda is the dearest, and this is confirmed by reference to Fig. 1. In Fig. 3, the black portion represents carbonate of soda, the shaded portion over No. 5 is the amount of carbon dioxide that is lost during the boiling of bicarbonate of soda, but which must be paid for. The unshaded portion denotes water of crystallization.

Examining Fig. 2, we find equal weights of the several porducts, which shows that in 100 pounds of sal soda there is only 36.7 pounds of carbonate of soda; in monohydrate, only 85.5 pounds; and in "48 per cent. ash" only 82.2 pounds, as against 100 pounds or 100 per cent. of carbonate of soda in "58 per cent. ash." From this diagram we see that sal soda is the weakest, "48 per cent. ash" next, and the monohydrate closest in strength to the "58 per cent. ash."

Now as to prices. Assuming the costs of these several products for bulk qualities, as follows:

58 per cent Ash at $ .68 per 100 pounds.
Monohydrate at $1.37½ per 100 pounds.
48 per cent. Ash at $ .56 per 100 pounds.
Sesquicarbonate at $1.28 per 100 pounds.
Bicarbonate at $1.00 per 100 pounds.
Sal Soda at $ .65 per 100 pounds.

we find that on an equal weight basis, commencing with the cheapest, they range as follows: 48 per cent. ash, sal soda, 58 per cent. ash, bicarbonate, sesquicarbonate, and monohydrate, but upon comparing costs with absolute alkali value, we see that there are required to equal "58 per cent. ash" in scouring value the quantities shown in Fig. 1, and which cost respectively:

116.9 pounds Monohydrate, at $1.375 ..... $1.60
121 pounds "48 per cent. ash," at $ .56 67
124.8 pounds Sesquicarbonate, at $1.28 ..... 1.59
269.8 pounds Sal Soda, at $ .65 ..... 1.75

Regarding the merits of the several forms of alkali used in textile mills, there is little to choose between sal soda and the monohydrate either in cost or efficiency, as the detergent value of both are nearly the same on a cost basis, the difference being only 1 1/2 mills per pound in favor of the monohydrate. These two forms of soda dissolve readily in warm water without sediment, and can be employed wherever soda is permissable. As no caustic can be present in either of them, they are perfectly safe to use on wool.

Sesqui carbonate and monohydrate cost practically the same, and both somewhat less than sal soda. Referring to Fig. 3, sesqui is seen to be 43.5 per cent. as "strong" as 58 per cent. ash, but its mildness offsets the strength of the latter.

As to soda ash "58," it is used to a considerable extent in woolen mills, mainly on account of its low cost, but where good grades of wool are handled, its use is quite objectionable in scouring on account of its tendency to impart harshness to the fibers, besides injury to the wool due to the possible presence of lime which reacts on the soaps used, and adheres to the stock.

Regarding soda ash "48," it should not be used in textile mills. Where it is employed, it should be rejected. As a matter of fact, this strength of soda is really intended for glass making, etc., and never intended for textile work.

While the difference in cost between sal soda or monohydrate averages 1 cent per pound in favor of soda ash, it is still a question whether better results are not obtained by the two former, and which compensate for the higher price. Of course, for low grade wools or for the scouring of shoddy materials, soda ash answers all purposes.

For use in cotton mills, whenever a carbonate of soda is found necessary, soda ash "58" is mostly employed, as traces of lime salts, or of sulphate are not likely to cause trouble, but iron is to be carefully tested for, and where found, the lot should be rejected, as iron stains will result.

Certain compounds of monohydrate and bicarbonate are to be found on the market, and while bicarbonate is more costly than soda ash, it is less than either sal soda or monohydrate, being about 1 per cent. per pound. As bicarbonate is less costly, it offers a temptation to mix it with the monohydrate, but it is doubtful whether it causes any inconvenience to users.

AN IMPROVED BLEACHING PROCESS

The Scotch process for bleaching textile materials, recently patented in this country, is described by the inventor as follows: The process consists in substituting a single operation for the alternate alkaline (bowking) and acid (souring) treatments, as used in the preparation of vegetable fibers for bleaching. The non-cellulose or incrusting constituents, which these chemical treatments remove, can be resolved and rendered soluble by the use of a solution of a bisulphite of a base, such as magnesium or sodium, which yields a soluble sulphite. When using this solution, the liberated SO_2 must be fully and completely removed so as to prevent the undue preponderance of acid in the solution, otherwise tendering of the fibers would occur due to the formation of hydrocellulose. If the freed SO_2 is retained, reversals in the chemical action may occur with the precipitation of organic substances of powerful reducing properties.

The digestion is carried out in a closed vessel with acid proof lining under pressure, and heated by coils, a jacket, or by direct steam. The temperature and percentage strength of the solution are varied to suit the material being treated, or the degree to which it is desired to be bleached. In all cases it is essential to provide a free outlet for the removal of the gaseous emanations. This at the same time insures the uniform penetration of the liquor.

The process conducted under the above conditions removes the lignified incrustations as well as the pectose and gummy ingredients. As there is no tendency toward mercerization, the structural formation of the fibers or filaments are not much altered, and their strength is not unduly impaired. So mild is the action and yet so complete is the resolution that the process can be carried out in one operation, to the extent necessary for easy bleaching of even jute and hemp.

The percentage composition of a suitable bisulphite liquor, (the proportions of base and available or free SO_2) is to a certain extent dependent upon the period of time and the temperature of cooking, the stronger the liquor the shorter the time at a given temperature, the effect being further modified by variation in temperature. The component percentages of base and available SO_2 are also varied to suit the nature of the fiber being treated according to its chemical characteristics (pectic or lignin) and its physical condition (simple fibers or filaments or thick woven textures).

It is essential to provide for the free escape of the SO_2 gas which is liberated in the heating or digestion. If this is not provided for, the free acid will affect the fiber, forming hydrocellulose. As this product is of a friable nature, the strength of the fiber or fabric is destroyed, or the presence of the excess acid may cause a reversal in the action, resulting in the deposition of an aldehyde which renders the fiber difficult to bleach. The lignified incrustations of the fibers are readily dissolved by the action of the SO_2, which on being used up in this way, or liberated as gas, frees the base which then attacks the pectic and gummy substances, resolving them, and thus the joint result is the removal of the materials which prevent bleaching. As neither the acid nor alkaline action of the bisulphite under the specified conditions is drastic, coupled with the fact that they throughout the process coact, the incrusting ingredients are removed without risk of the cellulose being injured.

The incrusting ingredients combined or with all the bast or equivalent fibers are of

lignin and pectic nature with admixtures of gums and waxes. To get full bleaching with the use of a minimum percentage of the hypochlorite or other bleaching agent, these must be more or less completely removed. It is necessary to provide SO_2 in sufficient quantity to dissolve the lignin. As its exposure to the action of this acid is to a certain extent dependent on the removal of the other incrustants, the process must proceed slowly and concurrently with the pectic removal which requires the action of the alkaline base. If the fibrous substance is pronouncedly lignified as is the case with jute, a liquor with a larger percentage of free or available SO_2 must be provided than need be applied for, say flax or hemp, where the pectic substances preponderate. When dealing with flax and hemp and like substances in which the pectic ingredients preponderate over those of lignin characteristics, it is not necessary to provide in the liquor when the sodium base is used, the full bisulphite proportions of SO_2. An acid sulphite will be suitable provided it contains, as far as the vegetable tissue is concerned, an excess of free or available SO_2, so insuring that all the lignin which is separated will at once be dissolved, the surplus escaping by the exhaust.

The continual relief of steam and the gaseous emanations, besides attaining the main chemical purpose as has already been described, also provides for the removal of any of the volatile waxes, and liberates air, so insuring uniform liquor penetration. Care must be taken that all the fibers are completely immersed, as otherwise oxidation will result.

Jute as raw fiber, or in the form of Hessian cloth, freed from the oils with which it has been impregnated to facilitate spinning, is placed in the digester, and covered by a solution giving the following analysis

Total SO_2	3.5%
Available or free	2.1%
Combined	1.4%

made from a magnesium base. One gallon of this liquor is used for 1 1/2 lbs. of cloth. The lid being bolted down, heating is commenced, and the full temperature of 280° F. is reached in four to five hours. Throughout all the cooking process a free escape to atmosphere is provided by the use of a small outlet pipe. During the initial stages of the heating this is kept open to remove the gasified SO_2, but thereafter, as the rate of gas liberation is slower, the outlet may be partially closed. The aperture must always be large enough to prevent the development of "false pressure" in excess of that equivalent to the temperature and owing to gas accumulation. Thus the pressure will always be in accordance with the saturated steam equivalent of the temperature. As steam escapes with the gases, concentration of the liquor takes place, and water must be added from time to time to keep the cloth covered. By maintaining this temperature for twenty hours the incrusting matters are so thoroughly removed that a white color can be easily obtained by the use of a relatively small percentage of a hypochlorite bleaching liquor. The residual liquor in the digester contains a fairly large percentage of $MgSO_3$, but this salt must be present in excess as it provides the carrier for the free or available SO_2.

Woven hemp is treated under similar conditions as to time and temperature with a bisulphite solution made from a magnesium base and containing the following percentages of SO_2:

Total	3.2
Available or free	1.7
Combined	1.5

This yields a material which is easily bleached to a full white color. This substance, having larger pectic constituents, uses up more of the base, and there is a greater escape of SO_2 than in the case of jute, but in both cases the acid and alkoline tendencies automatically regulate themselves to suit the grade of material being treated. The degree of chemical action required is very largely controlled by the extent to which the fibers have been mechanically separated. Thus it is very desirable to conduct the digestion with the fibrous ma-

terial in as simple and open a manner as possible. The stage of resolution is determined by a test of the total SO_2 contained in the resolving liquors. If this does not get below .25% no burning will occur.

A METHOD OF APPLYING LOGWOOD TO COTTON

From the Textile Mercury

A method of applying logwood that found some practical success years ago on certain classes of cotton goods, now has renewed interest in view of the increased utilization of logwood for the production of blacks. The method consists in passing the material first through a solution of the natural coloring matter, and, after squeezing, through a solution of a mordant, fixing, or oxidizing agent. The first may be a solution of logwood extract, or a mixture of logwood and fustic extracts, according to the shade of black required. The mordant or fixing bath may be a solution of any (or a mixture of any) of the salts or iron, copper, chrome, aluminium, or other metallic salts commonly employed as ordinary mordants for logwood blacks. For examples, the first liquor may be, for a blue shade of black, logwood extract 10° Tw., heated to 130° F.; for a jet or green shade of black, logwood extract 10° Tw. (160 parts) and fustic extract 10° Tw. (30 parts), heated to 120° F.; and for a blue color, logwood extract 3° Tw., heated to 120° F. The fixing liquors may be composed of (1) 60 parts acetate of iron 8° Tw. and 30 sulphate of iron 8° Tw.; (2) 60 parts acetate of iron 8° Tw. and 60 sulphate of copper 8° Tw.; or, (3) 60 parts acetate of chrome 8° Tw. and 60 parts acetate of iron 8° Tw.

After being impregnated sufficiently with the coloring material the goods are passed through the fixing bath long enough to take up sufficient of the mordant or oxidizing liquor, then squeezed between rollers, and at once passed into and through a chamber containing steam at a temperature of about 212° F., but not under pressure, whence they issue by a suitable opening (preferably water-sealed or luted) as soon as the action of the steam has effected the combination between the mordant or oxidizing agent used and the coloring matter. The goods may then pass to and through a washing liquor immediately or shortly afterwards.

THE FINISHING OF BELTING FABRICS

The machine shown in the illustration has recently been patented and is used for finishing belting fabrics. The inventor describes the machine and process as follows: Belting fabrics after being treated and dried often stretch so that it is necessary to remove portions of the belting in order to maintain a proper driving length. An object of the present invention is to provide a process and apparatus for treating fabric so that it will maintain substantially such length when in use. The illustration shows an apparatus embodying the improvements.

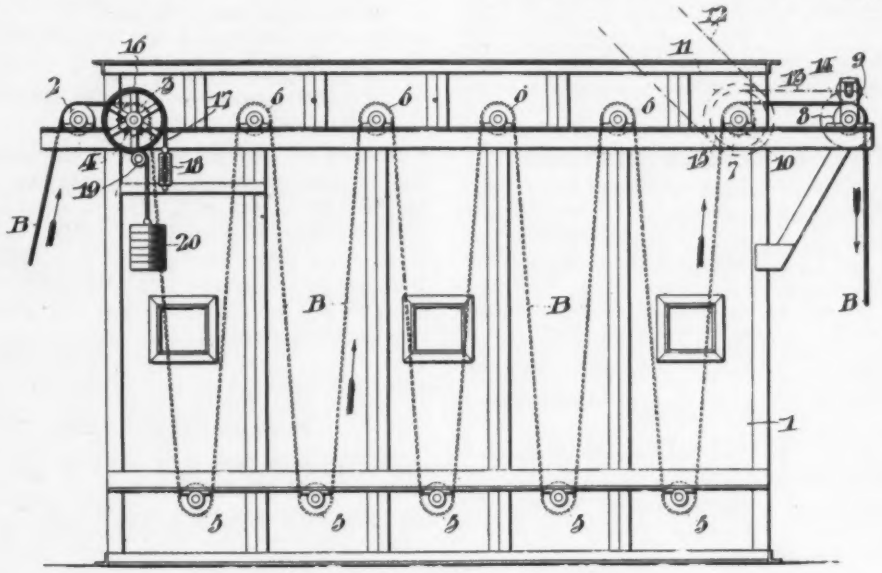
The process consists in placing sections of long lengths of belting under tension in the direction of its length and continuously carrying the area of tension along the belting and at the same time subjecting the section under tension to a drying atmosphere. The machine consists of a drying machine or compartment through which the belting travels continuously. The section of the belting travels within the drying compartment passes over rollers at the bottom and top of the compartment so as to increase the length or section of belting subjected to the drying atmosphere in the compartment.

A positive feed engages the belting and draws it through the compartment while a positive tension is placed on the belting where the latter leads into the compartment. The section of the belting exposed to the drying atmosphere of the compartment is constantly under a tension in the direction of the length of the belting.

The apparatus consists of a casing, 1, which may be of any desired construction. This is provided with a suitable heating device so that the asmosphere within the compartment is properly conditioned and tempered for drying the belting passing.

The belting, B, which has been properly treated is led into the compartment over a roller, 2, and a drum, 3. This drum is provided with spuds, 4, which engage the belting and prevent it from slipping on the drum.

The belting passes over a series of rollers, 5, 5, and 6, 6. These rollers are smooth and allow the belting to run freely over them. The path of the belting is indicated in broken lines in the drawings. The belting, B, passes over a drum, 7, and thence from the compartment over a roller, 8. A weighted roller, 9, bears on the belting on the roller, 8. The drum, 7, is provided with spuds, 10, which engage the belting and prevent slipping on the drum. This drum, 7, is positively driven by a sprocket pulley and chain. The roller, 8, is also positively driven by a sprocket chain, finally over the drum, 7, and thence over the roller, 8. The positive rotation of the drum, 7, will stretch the belting in the direction of its length, as the only means for rotating the drum, 3, is the pull on the belting. The belting is fed through the compartment continuously and the section between the drums, 3 and 7, will be continuously under tension during the drying of this section. The continuous travel of the belting causes the section being dried to be progressed along the length of the belting. In this way long lengths of fabric belting may be uni-



MACHINE FOR FINISHING BELTING FABRICS

which runs over a sprocket wheel connected to the roller.

The drum, 3, at the opposite end of the casing, 1, carries a belt wheel, 16. A brake strap, 17, is connected at one end to an indicator spring, 18. This strap passes around the wheel and over a guide roller, 19, and is connected to a series of weights, 20. These weights may be varied as to number, increasing or decreasing the power of the brake strap on the belt wheel.

The belting, B, which has been suitably treated and is ready for drying is passed into the drying compartment over the drum, 3, and is then led over pulleys, 5 and 6, and formly treated so that any section or given length cut from the long length of fabric belting will maintain its length under use.

THE CHINESE MARKET FOR DYES

China is probably the largest market in the world for dyed cotton cloth as its immense population is almost entirely clothed in cotton and the Chinese do not wear undyed cottons to a large extent, as white is a color for mourning. Immense quantities of synthetic indigo are sold in China and the white goods imported from Great Britain, Germany and the United States have been

very largely dyed in China in addition to the immense importations of colored fabrics. Unless China is able to obtain supplies of dyestuff or can substitute natural indigo for the synthetic product, our exports of undyed goods to that country are not likely to show any increase, although dyed cottons will find a ready market.

Dye Recipes

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 242

GREEN ON WORSTED DRESS GOODS

For Green on 100 lbs. of worsted dress goods, prepare dye bath with

1 lb. 3 ⅕ ozs. Amazo Blue.
2 ozs. 344 grs. Amazo Brilliant Red 2 B.
1 lb. Amazo Yellow R.
(American Dyewood Company, 80 Maiden Lane, New York City, N. Y.)
20 lbs. Glauber's Salt.
3 lbs. Oil of Vitriol.

Enter goods at 120° F., bring to boil in 1/2 hour. Boil one hour.

The above colors are recommended for their satisfactory fastness to light and washing and for their good level dyeing properties.

Recipe No. 243

BROWN ON WORSTED DRESS GOODS

For Brown on 100 lbs. of worsted dress goods, prepare dye bath with

3 ozs. 367 grs. Amazo Blue.
3 ozs. 227 grs. Amazo Brilliant Red 6 B.
420 grs. Amazo Brilliant Red 2 B.
7 ozs. 297 grs. Amazo Fast Yellow L R.
(American Dyewood Company, 80 Maiden Lane, New York City, N. Y.)
15 lbs. Glauber's Salt.
2½ lbs. Oil of Vitriol.

Enter the goods at 120° F., bring to boil in 20 minutes to 1/2 hour. Boil for one hour.

The above colors are recommended for their fastness and level dyeing properties.

Recipe No. 244

ORANGE BROWN ON COTTON YARN

Naphtamine Brown 3 G on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Naphtamine Brown 3 G.
(Kalle Color and Chem. Co., 530 Canal St., New York, N. Y.)
2 lbs. Soda Ash.
30 lbs. Common Salt.

Dye at a boil for one hour.

Naphtamine Brown 3 G gives an excellent shade of orange brown which possesses the characteristic properties of the direct cotton colors.

Recipe No. 245

PINK ON COTTON YARN

Algole Red 2 G Paste on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Algole Red 2 G paste.
(The Bayer Co., 117 Hudson St., New York, N. Y.)
8 lbs. Caustic Soda 52° Tw.
4 lbs. Hydrosulphite Conc.. Powder.
160 lbs. Glauber's Salt.

Dissolve the color with the necessary amount of caustic soda and hydrosulphite, and then add to the main bath. Stir well, allow to stand a short time, and then dye material at ordinary temperature for one hour. Finally rinse, sour with dilute sulphuric acid water and soap at a boil.

Algole Red 2 G Paste possesses very good fastness in every respect.

Recipe No. 246

BLUE ON COTTON YARN

Oxamine Dark Blue B G X on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Oxamine Dark Blue B G X.
(Badische Co., 86 Federal St., Boston, Mass.)
20 lbs. Common Salt.

Enter and dye at a boil for one hour.

Oxamine Dark Blue B G X possesses characteristic properties of the direct cotton colors.

Recipe No. 247

GREEN ON WORSTED YARN

Anthracene Direct Green B on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Anthracene Direct Green B.
(Cassella Color Co., 182 Front St., New York, N. Y.)
10 lbs. Glauber's Salt, Crystals.
1 lb. Acetic Acid.

Enter the goods at 105° F.; raise in 30 minutes to a boil and dye for one hour at boil.

The bath is then cooled by the addition of a little cold water and the material chromed for 1/2 to 3/4 of an hour at a boil in a bath made up with

1 lb. Potassium Bichromate.

Anthracene Direct Green B will be found to possess excellent fastness to washing and will prove a valuable color for the production of compound shades.

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Recipe No. 248

BLUE ON WORSTED YARN

Cyananthrol R on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Cyananthrol R.
(Badische Co., 86 Federal St., Boston, Mass.)
15 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Enter at 160° F. and dye at a boil for one hour.

Cyananthrol R gives a remarkably clear and brilliant blue.

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Recipe No. 249

RED ON WORSTED YARN

Wool Red B on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Wool Red B.
(Cassella Color Co., 182 Front St., New York, N. Y.)
10 lbs. Glauber's Salt, Crystals.
5 lbs. Acetic Acid.

Enter at 110° to 120° F. and bring to a boil in about 40 minutes, and then gradually add

5 lbs. Acetic Acid

to exhaust the color, continuing the boiling about 15 minutes longer.

Wool Red B gives an excellent red for the dyeing of deep bluish reds and for compound shades.

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Recipe No. 250

YELLOW ON COTTON YARN

Direct Yellow G Conc. on 100 lbs. cotton yarn. Prepare the dye bath with

1½ lbs. Direct Yellow G Conc.
(Kalle Color and Chem. Co., 530 Canal St., New York, N. Y.)
25 lbs. Common Salt.

Enter at 180° F. and dye at a boil for one hour.

Direct Yellow G Conc. possesses very high coloring and gives an excellent shade of yellow, possessing the characteristic properties of the direct cotton colors.

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Recipe No. 251

GREEN ON COTTON YARN

Sulphur Green G Extra on 100 lbs. cotton yarn. Prepare the dye bath with

5 lbs. Sulphur Green G Extra.
(Berlin Aniline Works, 213 Water St., New York, N. Y.)
20 lbs. Sodium Sulfide Crystals.
10 lbs. Soda Ash.
80 lbs. Glauber's Salt, Crystals.

Enter at 180° F. and dye at a temperature just below the boil for one hour, then immediately rinse and dry.

Sulphur Green G Extra possesses excellent fastness to washing, alkalies and cross dyeing.

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Recipe No. 252

BLUE ON COTTON YARN

Sulphur Blue B on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Sulphur Blue R.
(Berlin Aniline Works, 213 Water St., New York, N. Y.)
20 lbs. Sodium Sulfide, Crystals.
5 lbs. Soda Ash.
50 lbs. Glauber's Salt, Crystals.

First add the soda ash to the bath at 140° F., then add the dyestuff previously dissolved with the sodium sulfide and finally the salt. Dye for about one hour at a temperature of 120° F. to 140° F. After dyeing, squeeze well, allow to hang in the air for 1/2 hour, wash, soap and dry.

Sulful Blue B possesses good fastness to light, washing, alkalies and acids.

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Recipe No. 253

BLUE ON COTTON YARN

Alizarine Indigo 7 G on 100 lbs. cotton yarn. First prepare color solution with

10 lbs. Alizarine Indigo 7 G Paste.
(The Bayer Co., 117 Hudson St., New York, N. Y.)

which has been stirred up with a little water at 105° F., then add

7½ lbs. 52° Tw. Caustic Soda.
3 lbs. Hydrosulphite Conc.
1 lb. Monopole Soap.

Stir and allow to stand until color is completely dissolved.

Then add color solution to hot bath which has been heated to 175° F. Allow to stand for a short time and then dye for 3/4 to 1 hour at 175° F., air for 1/4 to 1/2 hour, then rinse and soap at a boil.

Alizarine Indigo 7 G Paste possesses very good fastness to washing, alkali, acid and cross dyeing.

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The wages for picking cotton in India are most paid in kind, the pickers receiving from one-sixteenth to one-quarter of the cotton picked, according to the variety.

New Machinery and Processes

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to the textile manufacturers. It is not a list of patents but of improvements on the market, the idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

Whenever possible we endeavor to make a personal investigation of the new machinery and processes described in this department. In the absence of such personal investigation we must necessarily rely upon information obtained from those who control the machines and processes.

We invite machine builders and others to send us such information for this department.

Pearl Stitch Knitting Machine. The Grosser Knitting Machine Co., 260 West Broadway, New York. An improved pearl stitch knitting machine built in this country. Orders are taken for delivery in October. A notice of the machine appears in another part of this issue.

Yarn Spooler. The Saco-Lowell Shops, Biddeford, Me., has recently brought out a spooler embodying a number of improvements. The new machine is described in another part of this issue.

Washer for Under-Clearer Rolls. A. H. Gulliver, Norwich, Conn., is introducing an improvement for under-clearer rolls for mules or spinning frames. It consists in putting a thin washer 5/32″ thickness, made of either fibre or leather, at the end of the roll which secures adequate protection to the cloth and wood, giving it longer life and when re-covered with brown duck or denim on the outside of roll they are claimed to be in as good condition as when new. A shop has been fitted up for the work of recovering rolls.

Yarn Mercerizing Machine. C. G. Haubold, Inc., Chemnitz, Germany. An improved machine for mercerizing yarn. The stretching rolls are set in pairs in a revolving frame. L. H. A. Schwartz & Co., 40 Central St., Boston, Mass., are the American agents.

Warp Printing Machine. F. Paatz, Koenigsstrasse, Berlin, Germany. A continuous machine for printing, steaming, rinsing and drying warp yarn for woven tapestry effects.

Paper Yarn Machine. The Erste Oesterreichische Jute Spinnerei and Weberei, Vienna, Austria. An improved machine for the manufacture of paper yarn. A moistening apparatus is attached to the delivery rolls.

Spindle Drive. The Saechsichen Maschinenfabrik, Chemnitz, Germany. An improved spindle drive for spinning machines. It is of the well known type in which the tension is kept uniform by a tension pulley.

Imitatation Lace. Ruehl & Klietsch, Langerfeld, near Barmen, Germany. A method of manufacturing narrow fabrics to imitate lace.

An Embroidery Attachment for Looms. F. Timmermann, Barmen, Germany. A device for producing embroidered effects on cloth during the weaving process.

Silk Reel. Brevetti Saracco, Turin, Italy. An improved reel for silk which is said to embody a number of improvements.

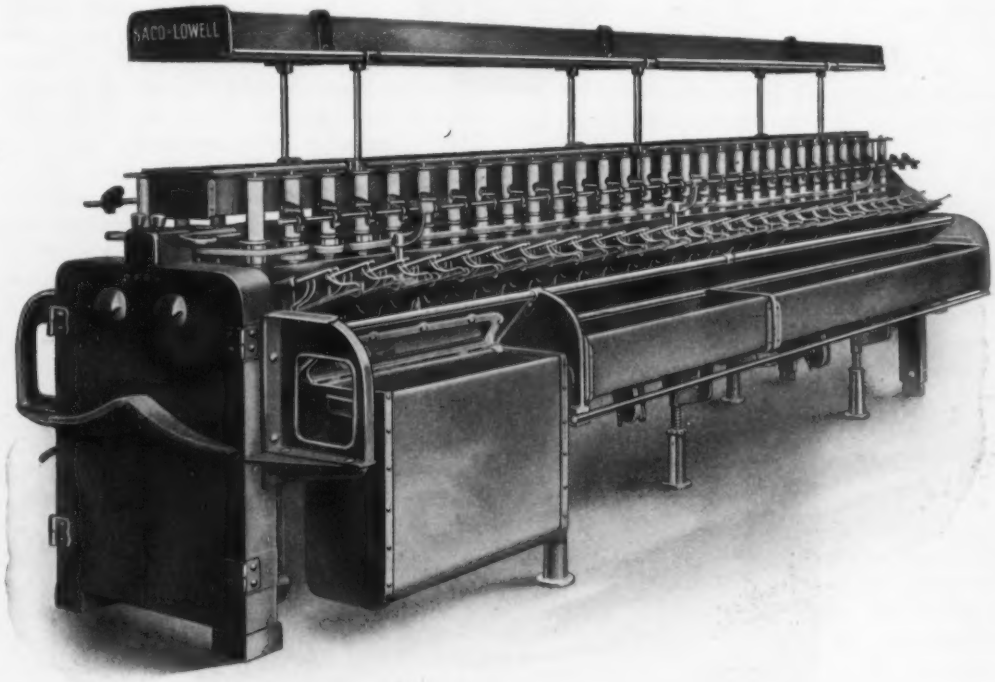
Beam Frame for Slashing Machines. Gebrueder Sucker, Gruenberg, Silesia, have recently brought out an improved frame for holding the beams from which the yarn is delivered to slashers. The frame is arranged so that a set of beams can be placed on each of the four sides. While the machine is drawing the yarn from one set another set can be made ready so that no time is lost in changing.

Regulating Tension on Yarn in Spinning. Julius Weinbrenner, Thann, Germany. An attachment on ring spinning frames for regulating the tension on the yarn as it is wound on different parts of the cop.

Twisting Machine for Twine, Banding, etc. Messrs. William Tatem, Ltd., Vulcan Works, Rochdale, Eng., has recently placed on the market an improved machine for manufacturing twine, banding, etc.

THE SACO-LOWELL SPOOLER

The latest design of spooler built by the Saco-Lowell Shops, Biddeford, Me., combines a suitable structure to enable a satisfactory spool to be built, with wide adjustment for shape and size of product. It is readily manipulated by the help, accessible and easily kept clean and in good order. Another feature is the stability of the traverse motion mechanism together with lifted out of their hinges, as desired. These doors are arranged so that the frame cannot be started while either is open, nor can the doors be opened while the frame is in operation. The mangle wheel and its attachments are thus simply and easily accessible without crawling under the frame or reaching in behind rails or rods of any kind. All change gears are accessible without removing guards. The chief function of this head



THE SACO-LOWELL SPOOLER

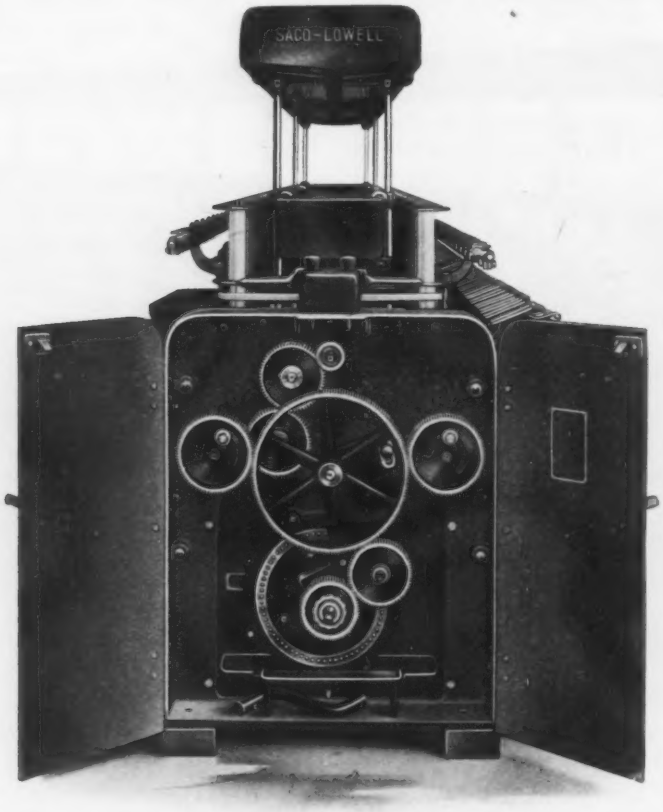
durable construction of all wearing parts. In working out these details the result has been to produce a spooler of a new design, embodying several patented improvements.

The drive of the spooler is from the foot end and it may be driven from either above or below. Driving from the foot end gives free access to the inside of the head end, which encloses the head end bearing, the cut gear traverse motion and universal mangle wheel. These parts are tightly enclosed by the finished head end casting and by the steel doors, which may be opened wide or end arrangement, in addition to the accessibility of the parts, is the protection of the mangle wheel and traverse device from lint and yarn accretions. The improved lubrication is also another advantage gained by this arrangement. The traverse motion is transmitted through gears entirely. The builders consider the rack and pinion to be the best device for spooler traverse motion. In this new spooler, the traverse of the thread guide rods is accomplished by two shafts running the full length of the frame and carrying lifting pinions enclosed in the sam-

sons, to raise and lower the lifter rods. These rods are racks and are cut to mesh with the pinions of the lifter shaft. Each lifter rack is enclosed by the hollow leg of a samson and entirely protected from obstruction, and in addition is connected, through the medium of the lifter shaft, with all the lifter racks on that side, so that as the traverse falls each rack is positively driven downwards. A release of the whole drive of each side is provided so that no breakage is possible from an obstructing spool or bobbin placed under the falling thread guide rod. The racks are positively driven upwards, and, with the condition noted, descend jointly by gravity.

The securing of proper position of the thread guides in relation to spool heads is accomplished by the adjustment on the head end lifter shaft gears, whereby the traverse on either side is adjusted independently in relation to head end mechanism without disturbing the setting of the mangle.

The mangle wheel is of high grade construction. In the head end an oil pan is placed, into which the mangle wheel dips at each oscillation, effectually oiling not only the mangle wheel and its pins, but also the traveler gear. A distinctive feature of this mangle wheel is its adjustable hub by means of which the crown or barrel of the spool may be varied to meet general mill condi-



THE SACO-LOWELL SPOOLER SHOWING GEARS

tions and changes, arising from change in the size of the yarn. Patents are pending for this feature, as well as for several other new developments.

The traveler gear is made of case-hardened steel and has bearings with a wearing surface several times as durable as were heretofore used on such parts. The gear slides back and forth in a guide while following the contour of the mangle wheel.

The feet of each samson are fitted with a special leveling device in the form of a jack nut, which when turned raises or lowers the frame and is held in the desired position by a suitable fastening. This device permits releveling of the frame at any time without removing lag screws from the floor.

The lower frame rods are raised high from the floor to enable free and easy mopping and sweeping under them.

The spindles have been shortened and more ballast has been added to the whirl to insure steadiness and obviate a doffer guard. Its construction with an enlarged blade is satisfactory from every point of view. The diameter of band whirl is 1 3/4 inches; of tape whirl, 3 1/8 inches.

Metal construction is used throughout on the new spooler.

Bobbin boxes are made with rounded corners to prevent the accumulation of lint or dirt.

All parts are interchangeable and careful duplication is obtained throughout accurate jig work.

The use of clamps is a feature of this machine, as all adjustments are of this type and there is not a single obstructive set screw on the frame, either on moving or stationery parts. The use of the new hollow, safety set screw is an attractive feature on the spoolers.

Oiling is accomplished throughout the frame by oil tubes which are freely used to make all oil holes accessible.

A neat and durable pulley guard and novel shipper are provided, each made and applied in a satisfactory manner to the driving end structure to meet all belt angles.

A very satisfactory application of the tape drive has been adapted to this spooler and is meeting with complete success. An 8 inch cylinder and 3 1/8 inch whirl is used, enabling the use of a very light weight on the idler sheave. This gives very long life to the spindle tapes and permits of great flexibility in the drive, overcoming the old difficulties of slack, overloaded bands, with spindles running at almost any speed or some stopped altogether. This spindle drive marks a distinct step ahead in connection with the drive of spooler spindles.

Several models of this spooler are built, presenting different combinations. The spooler shown in illustration, known as Model 1, is equipped with an empty bobbin conveyor and with side steel boxes for holding full supply bobbins.

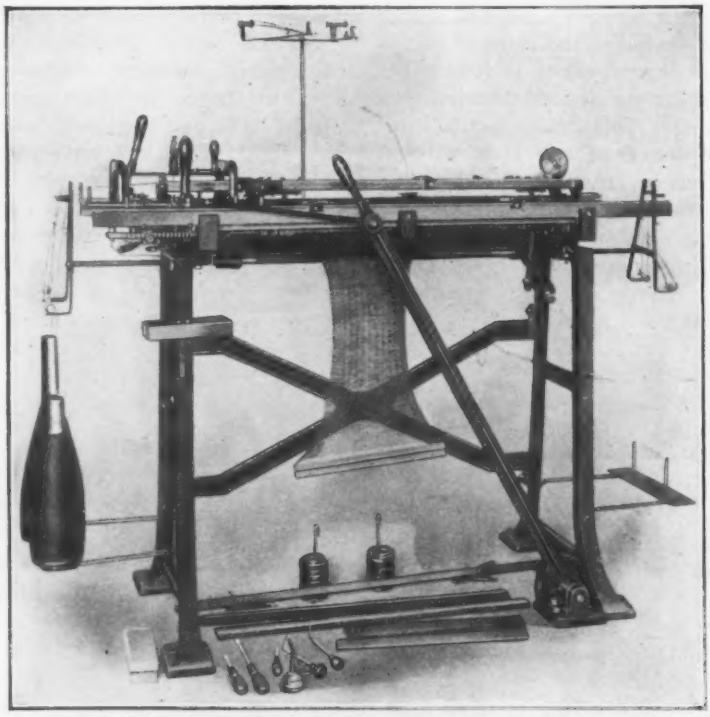
Model 2 is a spooler equipped with shelves for handling portable side boxes. With this system both the full and empty bobbins are handled in the same boxes, the empty bobbins being returned to the spinnings or twister room, the full bobbins being received in the same boxes. These boxes are often used directly on the doffing trucks in the spinning room.

AN IMPROVED PEARL STITCH KNITTING MACHINE

A new links and links or pearl stitch knitting machine is now being built in this country and offered for delivery in October by the Grosser Knitting Machine Co. of New York. Before the European war started this company established a well equipped plant to build and transform knitting machines and has been increasing the mechanical equipment as well as the force of experienced mechanics continuously, turning out a number of special flat knitting machines for silk sweaters and other attractive novelties.

The shortage of machines of the links and links type made it advisable to go into this particular field. Several striking innovations in the construction of the machines are now controlled by the Grosser Knitting Machine Co. through patents and royalty agreements and will be incorporated in the new machines under construction. One of the striking

features is the entire elimination of the troublesome jack lifters hitherto used on links machines. A patented, hinged sinker is used, assuring accurate work and permitting the operation of the machines at a much higher speed. Needle breakage is practically eliminated and the goods are turned out perfect in pattern and design. The machines will sell at the same price as the imported types and prompt deliveries can be guaranteed. For further particulars address the Grosser Knitting Machine Co., 260 West Broadway, New York.



THE GROSSER IMPROVED PEARL STITCH KNITTING MACHINE

For more than 3,000 years China jealously guarded its monopoly of the silk fabric, and great caravans journeyed from the cities of the empire to Syria and other parts of Asia, laden with woven silks and the raw filaments. The Persians became the intermediaries in this trade between China and Europe, supplying the Greeks and Romans until the middle of the sixth century A. D.

COOLING WATER OF CONDENSATION

[The following introduction to a collection of psychrometric tables for cooling tower work, published by the Wheeler Condenser and Engineering Co., Carteret, N. J., gives much useful information regarding the properties of moist air.]

In the process of artificially recooling condensing water, as by a cooling tower, 80 to 90 per cent. of the cooling is done by evaporation of water, which passes off as atmospheric moisture and increases the humidity of the air.

The figures usually desired are the weights of water vapor in a cubic foot of air when entering and when leaving the tower. The difference, times the increase in volume of the air entering and leaving the tower, gives the evaporation, and this multiplied by the latent heat gives the heat abstracted or the cooling.

The expression just used, "weights of water vapor in a cubic foot of air," is incorrect. What is actually meant is the moisture

in a cubic foot of space. The same cubic foot contains nitrogen, oxygen, carbon, dioxide, and various rarer gases, all of which, including the water vapor, form what we call air.

From Dalton's law of gaseous mixtures we know that the weight of vapor in any amount of space depends solely on its own partial vapor pressure and temperature. The temperature is the same as that of the air mixed with it; but the partial pressure of the water vapor is lower than that corresponding to this temperature, except when the space, or as it is usually stated, the "air" is saturated. Ordinarily the water vapor exists at a temperature above that of saturation. This means that the reader of this booklet is breathing superheated steam.

True, the steam is not high pressure super-heated steam, as from a boiler, but it is at a temperature above the saturation temperature, and therefore, according to definition, it is superheated.

In order to determine the amount of water vapor associated with air, occupying a known volume, we must determine the saturation temperature and, from ordinary vapor tables (steam tables), obtain the vapor pressure.

For this reason an indirect method of obtaining the dew point is used, namely, from suitable tables and from readings of the dry and wet bulb thermometers of a psychrometer, which consists of two thermometers suitably mounted, the bulb of one thermometer being covered by a close-fitting piece of muslin, which is well moistened in pure water, hence the term, "wet bulb." There are two kinds of psychrometers, the stationary and the sling. In the stationary psychrometer the two thermometers are suitably mounted and hung in a convenient place in the shade, and in a sling psychrometer they are whirled at a rate of about 200 revolutions by the observer. The sling psychrometer is the more accurate, and these tables are for use with sling psychrometer reading only.

The wet bulb temperature must not be confused with the dew point; it is from 0 to 20 degrees higher. The dew point is the saturation temperature corresponding to the pressure of the vapor, while the wet bulb temperature is the temperature to which the evaporation of water from a wet cloth cools the mercury bulb of a thermometer when slung through the air. What happens is a heat interchange; the wet bulb temperature first dropping and then finally becoming fixed when the rate of heat absorption by convection from the air through which it passes, equals the rate of cooling due to the evaporation of moisture.

Simultaneous observations of dew point and wet and dry bulb thermometer readings have formed the basis for formulas and tables connecting the three temperatures.

Once the dew point is known, the vapor pressure, the weight of moisture in a cubic foot, the relative humidity and the weight of the air in a cubic foot, etc., may all be obtained from steam tables and the fundamental law of gases.

The tables in this booklet of dry and wet bulb temperatures, dew point, per cent. humidity, and pounds of moisture per 1,000 cubic feet, were read from a large alignment chart prepared by Prof. H. L. Parr of Columbia University. The tables of properties of water vapor, by Marks & Davis, were used to obtain the vapor densities at different pressures.

The range of dry bulb temperatures is from 32 degrees to 140 degrees F., and of wet bulb temperature, 28 degrees to 140 degrees F.

When the wet bulb temperature and dew point are below 32 degrees, it is necessary for accuracy to know whether the vapor in the air was formed over ice, or "undercooled" water, since for the same temperature the former vapor has a lower pressure. These tables refer to water vapor throughout, including the lines with dew points below 32° where the maximum difference is one degree, as compared to vapor of ice. At lower dew points the difference would be greater. For very low temperatures the reader is referred to the U. S. Weather Bureau tables based on careful experiments of vapor pressure over ice.

In making winter observations with the sling psychrometer care must be taken that the wet bulb, if still moist, does not sud-

denly freeze and liberate heat. If it does, the whirling must be repeated until a minimum stable temperature is reached.

The absolute humidity is the amount of moisture, often expressed in grains, in a cubic foot of space, also occupied by air. In these tables the moisture is given in pounds per 1,000 cubic feet as a more practical engineering unit. The relative humidity is the ratio of the absolute humidity to the absolute humidity if the water vapor were saturated at the observed dry bulb temperature. Thus the air temperature might be 79 degrees and the dew point 65 degrees. The pressure corresponding to 65 degrees is .622 in. and the pounds per 1,000 cubic feet is .977. As the superheat is 14 degrees the volume is increased so that the pounds per 1000 cubic feet at 79 degrees = .977 × [(460 + 65) ÷ (460 + 79)] =.950

If saturated at 70 degrees the vapor pressure would be .996 in. and the density 1.523. The ratio .950 ÷ 1.523 = 62.5 per cent. is the relative humidity.

An approximate basis for calculations involving the movement of air, is 13 cubic feet per pound. To be accurate we must take into account the temperature of the air, and the partial pressure of the air which depends on the barometric pressure and the partial vapor pressure.

Vapor pressures are not given in these tables, but may be readily obtained by looking up the pressures corresponding to the dew point in a book of steam tables. Wheeler's "Steam Tables for Condenser Work" are entirely suitable for this purpose.

A convenient formula for the weight of 1,000 cubic feet of air is

$W = 1330 \times (B—V) \div T.$

Where W = weight of 1,000 cubic feet

B = barometric pressure in inches of mercury (mercury corrected to physical standard of 32°).

V = vapor pressure corresponding to dew point in inches of mercury.

T = Absolute temperature = 460 + Fahr.

This formula is based on the experimental determinations of Rayleigh and Leduc.

Example:

Barometric pressure 29.5.

Dew point from dry and wet bulb readings, 60°.

Air temperature, 70° (dry bulb).

The vapor pressure corresponding to 60° is 0.522 hes, therefore:

$W = 1330 \times (29.5—0.522) \div 530$
$= 1330 \times (28.978) \div 530$
$= 72.6$ lbs.

This is the sum of the weights of a 1,000 cubic of air and the vapor in a 1,000 cubic feet under the existing humidity.

For the foregoing conditions the tables give the pounds of moisture per 1,000 cubic feet as .81 and the total weight is

$0.81 + 72.6 = 73.41$ lbs.

While the absolute humidity is always expressed in grains per cubic foot, or as in this table, pounds per 1,000 cubic feet, it may be expressed as the weight of moisture associated with a given weight of air assuming a fixed barometric pressure. The assumed atmosphere pressure and the given conditions of temperature and dew point determine the volume occupied by the air, while the dew point determines the moisture in each cubic foot. Table II gives the pounds of vapor associated with 100 pounds of air saturated for dew points from 140° to 21°, and a barometric pressure of 29.92 inches of mercury.

The moisture per 100 pounds of air is the same for the same dew point temperature and barometric pressure, irrespective of variation in dry and wet bulb thermometer readings. Thus from Table I the dew point for 89° dry and 65° wet bulb is 50° and for 72° dry and 59° wet bulb it is also 50° and the moisture per 100 lbs. of air from Table II for 29.92 barometer is the same in both cases and equal to .7623 lbs.

Table I, which covers temperatures from 28° to 140° F., is illustrated by the following data for 87° dry bulb:

Thermometer Dry	Thermometer Wet	Dew Point Deg. F	Relative Humidity	Vapor in 1000 cu. ft. of Lbs.
87	71	63.4	46	.896
87	70	61.6	43	.837
87	69	59.8	40	.779
87	68	58.9	38	.740
87	67	55.8	35	.681
87	66	53.8	32	.623
87	65	51.7	30	.584
87	64	49 6	28	.545
87	63	47	25	.487
87	62	44.3	23	.448
87	61	41	20	.389

The value of the cotton goods, apparel, etc., actually consumed in the Union of South Africa in 1912 was $35,001,513, out of imports amounting to $36,511,286.

LOCK WASHERS FOR DRAPER LOOMS

From Cotton Chats

Millions of lock washers are used annually by the automobile manufacturers of this country to secure the bolts and nuts of automobiles and thereby safeguard the lives and property of the automobile traveling public against accident. The jar of the gasoline engine operated at high speed and the severe strains caused by running over rough roads combine to loosen everything in the machine that is not permanently anchored. It is of interest to know that the lock washers illustrated herewith are approved and used by manufacturers and engineers of national reputation.

In a weaving mill looms are conspicuously subject to wear and tear, and one regular duty of loom fixers is the tightening of bolts and nuts that become loose. The reason is obvious. A 40-inch loom for instance on a plain weave operated at 160 picks per minute, on a 54 hours weekly basis makes 26,956,800 picks per annum (without allowance for stops). This represents a travel of nearly six feet per pick, or 27,773 miles per annum.

Unlike most conveyances the trips of the shuttle are short and there must be a complete stop and reversal of direction at every alternate pick. This necessitates a neutralizing of the momentum of the shuttle, and although the binder and check perform this operation, there is of necessity much strain and wear. The motions of the loom are largely through cams which produce a shock when operated.

Several years ago the Draper Co., Hopedale, Mass., adopted a construction of loom frames where all joints are machined together making a better fit at such joints and also more uniformity in measurements in the working parts of the loom. Recognizing the old difficulty of bolts and nuts becoming loose and the resulting troubles which follow, they have adopted the example of the automobile makers and are now equipping their looms with positive lock washers in all places where they can be used. An actual count on one of their narrow looms showed 185 of these washers.

While this means a material added cost to the company, it also means a great reduction in wear and tear of looms to their customers with a corresponding reduction in the labor of loom fixers and in cost of supplies. A recent report from a mill where new looms provided with lock washers are being started showed less general breakage of parts than usual and practically no call for tightening of bolts. The illustration,

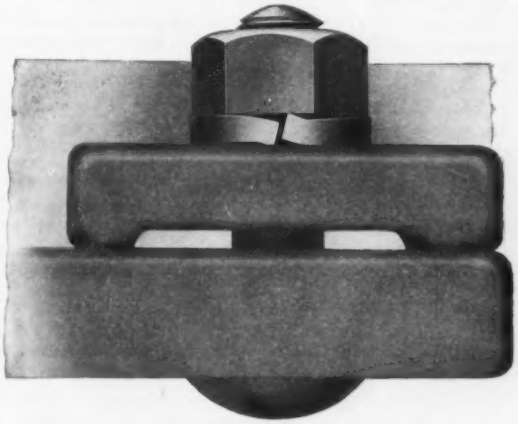


FIG. 1

Fig. 1, shows the appearance of a joint on the Northrop Loom secured by the lock washer. The separate illustration, Fig. 2, of

FIG. 2

the washers show the sharp angular sections which bed themselves into the material on either side.

Attention is called to the important improvements in general construction of Northrop looms. The looms are heavier than is customary. The frames are machined together. They are secured by bolts with lock washers. The gears have cut teeth. The let-off, take-up harness motion are all from special designs and improvements over the older motions.

Northrop looms are now being operated on practically all classes of cotton goods that can be woven with one shuttle. Such looms make a saving in labor cost of weaving, improve the quality of the product, and make an easier job for the weaver, at increased pay.

Personals

Ivar L. Sjostrom, who, for a number of years was head of the United States Worsted Company's mills at Lawrence, Mass., and of the Lawrence Dye Works, has been appointed agent and general superintendent of the Saxonville Mills, Saxonville, Mass.

Edson L. Page, in charge for many years of the office of the Turner's Falls Cotton Mills, Turner's Fall, Mass:, has been appointed superintendent of this mill to succeed the late Charles N. Sumner. J. Martin Schneider is to succeed Mr. Page and Thomas Lonergan has accepted a position as general supervisor of manufacturing and equipment.

C. E. Bailey has been appointed superintendent of the Franklin Mills Corporation, Unionville, Mass. He was formerly employed at the Stark Mills, Manchester, N. H.

J. Howard Fryer has accepted a position to take charge of the Chicago office of the A. H. Rice Silk Company of Pittsfield, Mass.

Wilfred Larochelle has been appointed assistant manager of the Novelty Knitting Company, Woonsocket, R. I.

T. J. Sheehan has been appointed superintendent of the Jamesville Woolen Mill Company, Worcester, Mass.

M. G. Rosenthal has tendered his resignation to the Mentor Knitting Mills of Mentor, Ohio, to take effect September 1. For the last eight years Mr. Rosenthal has been connected with this company, first as superintendent of their plant at Mentor and later as general superintendent of both the Mentor plant and the one at Erie, Pa.

H. Edward Pickering has been appointed general manager of the Peerless Knitting Mills Company, Boston, Mass. Mr. Pickering was formerly assistant superintendent of the knitting department at the Tremont & Suffolk Mills, Lowell, Mass.

Warren E. Wood, for thirty-two years overseer of weaving at the Avon Mill, Lewiston, Me., has resigned his position with that company. The loom-fixers in the mill presented him with a fine meerschaum pipe and box of cigars, the weavers a solid gold chain and Knights Templar charm, and the office force a diamond Shriner's button.

W. H. Freeman has accepted the position of overseer of weaving at the Avon Mill, Lewiston, Me.

John W. Dearden has accepted a position as overseer of carding at the Chester Spinning Company, Chester, Pa.

Oscar Bourgeault has accepted a position as overseer of spinning, spooling and twisting at the Merino Mill, Joslin Manufacturing Company, Providence, R. I.

Herbert Hopkins has accepted a position as overseer of dyeing at Fairbanks & Dorr Mill, Guild, N. H.

John W. Sands, overseer of finishing at the Franklin Mills, Franklin, N. H., has resigned his position with that company.

Thomas M. Meehan overseer of dyeing at Fairbanks & Dorr Mill, Guild, N. H., has resigned his position with that company.

Edward A. Donahue, overseer of spinning at the Aetna Mill of the Wright's Health Underwear Company, Cohoes, N. Y., has resigned his position with that company.

W. J. Mahaffee has accepted a position as overseer of weaving at the Kincaid Mill No. 2, Griffin, Ga.

W. W. Foster has accepted a position as designer at the Drayton Mill, Anderson, S. C.

A. M. Reese has been appointed superintendent of the Weldon Manufacturing Company, Weldon, N. C.

J. M. Waddleton has accepted a position as overseer of weaving at the Inverness Mill, Winston Salem, N. C. He was formerly employed at the Calvine Mill, Charlotte, N. C.

W. H. Gibson, Jr., has been promoted to the position of superintendent of the Fairmont Manufacturing Company, Fairmont, S. C.

W. P. Sanders has been promoted to overseer of slashing, winding and leaming at the Altavista Cotton Mills, Inc., Altavista, Va. H. G. Leigh has been promoted to the position of assistant superintendent at this mill.

J. B. Bailey has accepted a position as overseer of carding at the Sycamore Mills, Sycamore, Ala.

W. E. Stafford has been appointed superintendent at the White-Williamson Manufacturing Company, Saxapahaw, N. C.

M. T. Sanford has accepted a position as overseer of spinning at the Pomona Mills, Greensboro, N. C. He was formerly employed in a similar position at the Midway Mills, Rockingham, N. C.

J. R. Lee has accepted a position as overseer of carding at the Danville Knitting Mill, Bon Air, Ala. He was formerly employed at the Gluck Mill, Anderson, S. C.

Thomas H. Henderson has been appointed superintendent of the Cowpens Manufacturing Company, Cowpens, S. C.

F. T. Newberry, superintendent of the Selma Manufacturing Company, Selma, Ala., has resigned his position with that company.

William Batten has accepted a position as over-

seer of carding and spinning at the Utica Knitting Company, Mill No. 5, Sherburne, N. Y. He comes from Pawtucket, R. I.

George W. Merrow, second hand of carding at the William Clark Mills, American Thread Company, Westerly, R. I., has resigned his position with that company.

Alexander B. Bernard, assistant foreman at the Finlayson Flax Spinning Company, North Grafton, Mass., has resigned.

W. G. Keeble has been appointed manager of The William Mitchell Company, Kincardine, Ont., Canada.

Frederick Eick, superintendent of the Bradford Mill, J. & J. Dobson, Inc., Germantown, Philadelphia, Pa., has resigned his position with that company.

George Bassett, formerly overseer of carding at the Hecla Mill, American Woolen Co., Uxbridge, Mass., has secured a similar position with a large knitting mill in Scranton, Pa.

Eben S. Draper, son of the late Governor Eben S. Draper, has started work in the Draper Company's plant at Hopedale, Mass. He is engaged in the drafting room and will learn the business. He graduated from Harvard University in June.

Henry Hamill has accepted a position as overseer of carding at the Holliston Woolen Company, Holliston, Mass. He was formerly employed at the Bellingham Woolen Company, North Bellingham, Mass.

C. H. Blackburn, overseer of spinning at the Devonshire Mills, Goff's Falls, N. H., has resigned his position with that company.

H. G. Tietze has accepted a position as overseer of spinning at the Devonshire Mills, Goff's Falls, N. H.

C. A. Hueber has accepted a position as overseer of spinning at the Windham Manufacturing Company, South Windham, Me.

John Cantlin has accepted a position as overseer of carding at the Rock River Woolen Company, Janesville, Wis. He was formerly employed at the Patrick Duluth Woolen Mill, Duluth, Minn.

R. D. Lowe, overseer of carding at the Joseph Noone's Sons Co., Peterboro, N. H., has resigned his position with that company.

M. J. Lannon has accepted a position as overseer of finishing at the Franklin Mill, Franklin Falls, N. H. He was formerly employed at the Middlesex Mill, Lowell, Mass.

John H. Hall has accepted a position as overseer of carding at the Joseph Noone Sons Co., Peterboro, N. H.

J. F. Rigney has accepted a position as overseer of finishing at the Mann & Stevens Woolen Co., East Brookfield, Mass.

William F. Follett has accepted a position as second hand of carding at the Killingly Manufacturing Co., Killingly, Conn.

William D. Hussey has accepted a position as overseer of dry finishing at the Ardmore Mill, Yantic, Conn.

John Lynch has accepted a position as overseer of carding at the Bellingham Woolen Co., North Bellingham, Mass. He was formerly employed at the Holliston Woolen Co., Holliston, Mass.

Joseph Costine, overseer of finishing at the Gilsum Woolen Company, Gilsum, N. H., has resigned his position with that company.

David A. Lapraik, overseer of dyeing at the Clinton Knitting Company, Clinton, Ont., Canada, has resigned his position with that company.

Cason J. Callaway has accepted a position as bookkeeper and cashier at the new Hillside Cotton Mills, LaGrange, Ga.

W. P. Hamrick has been appointed general superintendent of the group of mills embraced in the Hampton Mills Company, Greenville, S. C., to succeed H. G. Welborn.

S. B. Shipp has accepted a position as overseer of weaving at the Inverness Mill, Winston-Salem, N. C.

Guy R. Lewis has been promoted from assistant to superintendent of the Kentucky Cotton Yarn Company, Louisville, Ky.

D. B. Mehaffey has accepted a position as overseer of spinning at Mill No. 1 of the Lancaster Cotton Mills, Lancaster, S. C.

T. D. Pemberton has accepted a position as overseer of spinning at Mill No. 2 of the Lancaster Cotton Mills, Lancaster, S. C.

H. C. Moore has accepted a position as overseer of carding and spinning at the Gaston Cotton Mills, Cherryville, N. C. He was formerly employed at the Buffalo Mills, Stubbs, N. C.

G. T. Lashley has been appointed superintendent of the Hopedale Mill, Burlington, N. C.

Grover White has accepted a position as overseer of carding and spinning at the Glen Raven Mill, Burlington, N. C.

R. T. Comer has been appointed superintendent of the new Hillside Cotton Mills, LaGrange, Ga. He was formerly superintendent of the Pioneer Cotton Mills, Guthrie, Okla.

J. A. McFalls has accepted a position as overseer of spinning at the Jewell Mill, Thomasville, N. C. He was formerly employed at the Lynchburg Cotton Mills, Lynchburg, Va.

T. S. McGalliard has accepted a position as overseer of spinning at the Inverness Mills, Winston Salem, N. C.

Haldon Cook has accepted a position as overseer of spinning at the Mooresville Cotton Mills, Mooresville, N. C., to succeed Edgar McNeely. He formerly held this position and comes from McAdenville, N. C.

James Blue has been promoted from night superintendent to superintendent of the Delburg Cotton Mills, Davidson, N. C.

Harry Newhall, for several years second hand in the drawing department at the Pacific Mill, Lawrence, Mass., has been promoted to the position of overseer in the spooling department to fill the position made vacant by the death of the late James H. O'Connell.

L. G. Drummond has accepted a position as overseer of finishing at the Virginia Woolen Company, Winchester, Va.

James F. Reed, overseer of spinning and spooling at the Shetuket Company, Norwich, Conn., has resigned his position with that company.

Fred Langley has accepted a position as overseer of carding and spinning on the night shift at the Rockford Mitten & Hosiery Company, Rockford, Ill. He was formerly employed at the Orr Felt & Blanket Company, Piqua, Ohio.

W. B. Green has accepted a position in charge of the finishing department at the New Castle Knitting Mills, New Castle, Pa.

H. McKenzie has accepted a position as overseer of dyeing at the Bates Manufacturing Company, Lewiston, Me.

DEATHS.

Charles Heber Clark, of Conshohocken, Pa., died at Eaglesmere, Pa., on August 10 after a long illness. Mr. Clark, who is best known in the textile trade as the editor of the Textile Record, had won a national reputation as an author, lecturer and stalwart defender of a tariff for the protection of American industry. Born in Berlin, Md., on July 11, 1841, the son of Rev. W. J. and Annabelle Clark, he began his business career as reporter for the Philadelphia Inquirer, where he soon became dramatic critic. In 1867 he joined the editorial staff of the Philadelphia Evening Bulletin, becoming one of the owners in 1875. Here he began preaching the doctrine of protection, a work which he continued almost to the day of his death. In 1877 Mr. Clark took an active part in the organization of the Manufacturers Club of Philadelphia, and was appointed its first secretary, a position he held for ten years, exerting great influence in tariff matters through the weekly Bulletin of the Club, by arguments before congressional comittees and in many other ways. He distinguished himself not only by his loyalty to the protective cause, but also by his independence, which was often forcibly exhibited by opposition to prominent protectionists when he believed them to be wrong.

A close observer of men and affairs, he gained a wide knowledge of human nature during his career as a journalist This knowledge and his literary attainments were shown in a number of books, some humorous and others of a more serious character, beginning with "Out of the Hurly Burly," 1874, which was followed by "Elbow Room," "Captain Bluit," "Happy Hollow," 1903, "The Quakeress," 1905, and "By the Bend of the River," the last a collection of tales suggested by his home and neighbors.

Mr. Clark was prominent in the organization of the J. Ellwood Lee Company, Conshohocken, Pa., manufacturers of surgical appliances, and was made president of the corporation. This position he held until the business was merged in that of the Lee Tire & Rubber Co.

Mr. Clark was active in church work. Thirty-nine years ago he organized a Bible class at Conshohocken and remained in charge of it until his strength failed a few months ago. Local affairs engaged his active interest and he was a leader in every enterprise for the development of his home town. Mr. Clark was a veteran of the civil war and a member of George Smith Post No. 79 G. A. R. He is survived by a widow, three sons and two daughters.

William A. Dickel, widely known among the textile trades of Philadelphia, Pa., died suddenly on August 19, in Ocean City, N. J., of acute indigestion, where he was spending the summer months with his family, the body being removed to his home in Melrose Park, Pa., for burial. Mr. Dickel will be remembered by the trade as being connected with one of the oldest textile manufacturing concerns in this vicinity, a business started very many years ago by his father, the late Henry Dickel, for the manufacture of ingrain carpets. A few years ago he retired from the carpet trade, disposed of the equipment of the plant and started up a new business in the Arizona St. mill under the name of Henry Dickel & Son, in which he manufactured mercerized, silk and artificial silk laces and braids. Later on he incorporated and started the Industrial Tape Mills Company, of which he was president and treasurer up to the time of his death, and which has been successfully engaged in making narrow fabrics at Jasper & Huntingdon Sts. Mr. Dickel was also identified with the Industrial Trust, Title & Savings Company of Philadelphia, being a member of its Board of Directors for many years.

John R. Curran, for the past ten years secretary and treasurer of the Phoenix Silk Mills, Paterson, N. J., and for forty years connected with that concern, died August 16 at his home in that city, at the age of 83 years, from the effects of a stroke of paralysis received several years ago. One daughter survives him.

John W. Platt, member of the firm of Platt Bros., manufacturers of yarns, Manayunk, Philadelphia, Pa., died at his home in Roxborough, Philadelphia, of heart trouble, at the age of 63 years. He succeeded his father, John W. Platt, deceased, in the yarn business.

E. G. Eberhardt, wealthy philanthropist, vice-president and general manager of the Mishawaka Woolen Company, Mishawaka, Ind., committed suicide on his son's grave in the Mishawaka Cemetery on August 17, by shooting himself twice through the heart. Grief over the death of his son, Harris, in an automobile accident, is believed to have caused the act. He was 49 years of age.

George F. Small, for fifteen years superintendent of the Clark Thread Company, Newark, N. J., died recently.

John B. Curtis, agent of the Atlantic Cotton Mills, Lawrence, Mass., until their purchase by the Pacific Mills, died August 19 at the Barr Sanitarium, following an operation for appendicitis. He is survived by his widow and one daughter.

Frank P. Sheldon, designer of many of the mills throughout the country, died August 17, after a short illness, at the age of 69 years. In 1870 Mr. Sheldon established himself in business in Providence as a mill engineer, and until his death directed his energy toward the development of that business. Because of his eminence in the textile world, Mr. Sheldon was appointed Director of Textiles of the United States Commission to the Paris Exposition in 1900. His widow and three children survive him.

Fred Aiken, son of Walter Aiken, a pioneer hosiery manufacturer, died recently. He was born in Franklin, N. H., November 4, 1855, and was educated at Colby Academy and Norwich University. For several years he was employed in the machine shop and hosiery mills owned by his father, and after the latter's death was associated with his brother, James Aiken, in conducting the hosiery business under the firm name of Walter Aiken Sons. Two sons and two daughters survive him.

Edwin J. Ross, of Dexter, Lambert & Co., silk manufacturers of Paterson, N. J., and formerly president of the E. J. Ross Manufacturing Co., Jersey City, N. J., died August 21 from a complication of diseases. Mr. Ross was 64 years of age. He was active in Presbyterian church work and was a member of the Manhattan Club, of New York City and the Washington Association, of New Jersey. He was vice-president of the Ross Clan, a Scottish organization. His wife and ten children survive him.

James Bright, general manager of the Dunbarton Flax Spinning Company, Greenwich, N. Y., died at the Samaritan Hospital in Troy, N. Y., at the age of 63 years. He is survived by his wife, one son and two daughters.

William Pendlebury, of the firm of Pendlebury & Bro., Aramingo Dyeing, Finishing & Printing Works, Frankford, Philadelphia, Pa., died August 8, following an illness of six weeks, at the age of 67 years. One daughter survives him.

Alphonso H. Brothers, for forty-four years connected with the Dunham Hosiery Company, Poquonock, Conn., and for twenty-four years general manager of the underwear plant, died recently at the age of 68 years.

Harold Farquhar Hadden, president of the firm of Hadden & Company, Inc., silk importers of 212 Fifth Avenue, New York City, died August 11 at his summer home in Seabright, N. J., in his sixtieth year. He was educated in England, being graduated from Cambridge University in 1876. Mr. Hadden was a member of the University, Church, Merchants', Rumson Country, and Colony Clubs. He is survived by his widow, two daughters and three sons.

James P. Tolman, for thirty years president of the Samson Cordage Works of Boston, Mass., died Wednesday, July 28, at his home in West Newton, Mass., in his sixty-eighth year. He had been ill since last April, when he had a stroke of paralysis. Mr. Tolman was born in Boston. He attended the public schools in Roxbury and then entered the Massachusetts Institute of Technology, from which he was graduated with the first class sent out from that institution, in 1868. He then entered the cordage business and in 1884 established the Samson Cordage Works, doing business as a partnership under the name of J. P. Tolman & Company. This organized into a stock company in 1888 with Mr. Tolman as president; Herbert G. Pratt, treasurer, and Frank D. Aldrich, secretary. His untiring energy, sterling character, and uniform courtesy won for him many friends in the trade and in the community.

Charles N. Sumner died at Sunapee Lake, N. H., where he had been for some time on account of poor health. He was superintendent of the Turner's Falls Cotton Mill, Turner's Falls, Mass., and was prominent in town and social affairs, also Masonic orders. He was a native of Brattleboro, Vt., but lived most of his life in Turner's Falls. His early education was obtained in public schools and he was graduated from the Turner's Falls High School and Cornell University. His widow, one daughter and two sons survive him.

James S. Wilson, of the firm of James Wilson & Sons, manufacturers of tapes and bindings, Philadelphia, Pa., died July 31 at his home in that city. He had been in poor health for a number of years but maintained an active interest in the business until about two years ago when he was stricken with paralysis which resulted in his death.

Herbert L. Pratt, for twenty-three years agent of the Bates Manufacturing Company, Lewiston, Me., died at his home in that city July 31. He resigned his position with this company in 1908 and since that time his health has been failing gradually. He was the son of Leander and Martha (Stone) Pratt and was born in Grafton, Mass., September 5, 1850. Mr. Pratt was educated at public schools and finished his education at Worcester Academy. His first position in a textile mill was at Tilton, N. H. He was a member of the Pine St. Congregational Church and was affiliated with Masonic orders, a member of Calumet Club and Home Market Club. His widow, two sons and one daughter survive him.

Peter James Dockray, for the past eight years superintendent of the Lawton Spinning Company, Woonsocket, R. I., died at his home in that city August 3, after a lingering illness. Death was due to stomach trouble. He had been a sufferer for several years. Mr. Dockray was born February 20, 1855 and is survived by his wife and three daughters.

Nathan G. Kenyon, thirty-two years of age, overseer of carding at the Royal Weaving Company, Pawtucket, R. I., was found unconscious in a bath tub in his boarding place in that city. He was hurried to the Memorial Hospital but died on the way. Death was caused by acute indigestion. He was recording secretary of the Pawtucket Veteran Firemen Association.

New Publications

Any work noticed under this heading can be obtained, postage or express charges free, by sending the price listed to Lord & Nagle Company, 144 Congress St., Boston, Mass. A catalogue of textile books in the English language will be sent free on application.

The World's Cotton Crops, by John A. Todd, B. L., Professor of Economics, University College, Nottingham, England, 460 pages, 5 x 7 1/2; A. & C. Black, Ltd., 4 Soho Square, London, W.

The author has aimed in this work to give a condensed but comprehensive account of the production of cotton throughout the world. He states frankly in the preface that he is not a technical expert on cotton cultivation, but has gone carefully through the material and sifted it so as to include only the best available information on the subject. His experience in Egypt and his college training have fitted him for such work, and the result is a very useful handbook of cotton production. The author completed the work a few weeks before the outbreak of the great war at a time when the cotton problem facing the world was to provide an increase in the supply in order to prevent a cotton famine. The war has changed all that temporarily at least. In a separate chapter the author deals with the effects of the great conflict. The work is freely illustrated and contains a number of excellent maps. The following abstract from the table of contents shows the manner in which the subject has been treated: Introductory; The Cotton Plant: The Geographical Distribution of Cotton; India; China, Japan, and Indo-China; Russia, Persia, and Asia-Minor; The United States, Mexico; The Price of American Cotton; British West Africa; East and South-East Africa (British); Other African Colonies; South America; Long Staple American Upland; Egypt; The Anglo-Egyptian Sudan; Sea Island Cotton; Oceanica; The Uses of Cotton; The Uses of Cotton-Seed; The Effects of the War; Statistical Appendix: Production, Consumption, America, India, Egypt, and Prices.

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The Development and Properties of Raw Cotton, by W. Lawrence Balls, M. A., 214 pages, 5 x 7 1/2; A. & C. Black, Ltd., 4 Soho Square, London, W. Price $2.00.

The author, formerly botanist to the Khedivial Agricultural Society of Cairo, and to the Egyptian Government Agricultural Department, has written this book in order to present the history of the development of cotton-lint. The work has a number of excellent illustrations. The contents are arranged under the following heads: The Development of Pedigree; The Development of the Plant; The Development of the Boll, I. Structural; The Development of the Boll, II. Environmental Influences; The Development of Commercial Lint; The Development of Cotton-Growing; Methods of Investigation; Tables of Statistical Data.

The Science of Fabrics and the Testing of Cloths. (Stoffkunde und Warenunterouchung); by W. Reuff, Director of Weaving in Sindelfingen-Stuttgart, 266 pages, 5 1/2 by 8 1/8; T. B. Metzlersche, Buchhandlung, Stuggart. Price $2.00.

This volume contains a condensed account of textile raw materials, the manufacture of yarn and construction of fabrics, together with the testing of textile materials, the contents being arranged under the following heads: Raw materials and yarns; How Woven Fabrics are Produced; Dyeing, Bleaching, Printing and Finishing; Testing and Appraising Fabrics. There are a number of illustrations. The volume contains a large amount of useful information regarding the various branches of textile manufacturing, making it a very valuable handbook for both students and mill men. The text is in German.

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BUSINESS LITERATURE

The Fulton Cut Maker; Saco-Lowell Shops, Lowell, Mass.

A 3-page folder illustrating and describing the Fulton cut marker for identifying cloth patterns. In mills where a number of patterns of cloth are made there is often so much similarity between them that mistakes frequently occur by using the wrong warp. With the slasher equipped with the Fulton cut marker this difficulty is removed.

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Psychrometric Tables for Cooling Tower Work; Wheeler Condenser & Engineering Company, Carteret, N. J.

This booklet gives a series of psychrometric tables which the publisher states are the only standard tables of this kind that have been issued in complete form. The new tables are based on readings from a large alignment chart calculated by Prof. H. L. Parr of Columbia University.

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The Story of the Oldest Cotton Mill; U. S. Gutta Percha Paint Co., 19 Dudley St., Providence, R. I.

This circular gives an account of the coating of the interior of the Lippitt Cotton Mills, Lippitt Village, R. I., wth Rice's "Mill White." When the old Lippitt mill was built, whitewash was used on the walls and ceiling, and during the past hundred years scores of layers of whitewash have been applied. This was continually scaling off and requiring frequent repainting. A short time ago, B. B. & R. Knight, the present owners, had Rice's Gloss Mill White applied to all the walls and ceiling. The result is that the scaling nuisance has been permanently stopped and the glossy finish makes the interior as bright as a modern plant. Illustrations are given showing the condition of the working room at the present time.

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Steam Trap Catechism; American Steam Gauge & Valve Manufacturing Co., Boston, Mass.

This sixteen page booklet begins with a series of questions and answers relative to the steam trap. In addition there is much useful information

regarding the best type of trap to be used and the economizing of steam by the use of the American Ideal steam trap. There is an imposing list of the users of the American trap in various parts of the country.

Why Trade Marks Expire With Patents; by Henry C. Thomson, 15 State St., Boston, Mass.

This is a 16-page pamphlet giving much useful information regarding the expiration of patent and trade mark rights. Mr. Thomson is a specialist in trade mark and patent law and has stated his views in a very clear manner, illustrating his argument in a way that carries conviction.

Bulletin of the Textile School of North Carolina, West Raleigh, North Carolina; Thomas Nelson, Professor of Textile Industry.

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Boiler Valves; The Wm. Powell Co., Cincinnati, Ohio.

This booklet illustrates a complete line of boiler room valves that are manufactured by the Wm. Powell Co. They are suitable for installation in any industrial plant throughout the country. The booklet is distributed generally and is well printed and illustrated.

Industrial Notes

BOSTON OFFICE

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SALES MANAGER OF THE PERMUTIT CO.

A. R. Calro, who for nearly two years has been textile representative of the Permutit Co., of New York, has been appointed manager of sales for the company. He will continue to give all textile inquiries his personal attenion.

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We take this opportunity of thanking all who have so kindly offered expressions of sympathy, which we have been unable to acknowledge previously. Trusting for a continuance of our agreeable relations, we remain

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THE G. E. "HOME ELECTRICAL"

The "Home Electrical," an exhibit of the General Electric Company in the Palace of Manufactures at the Panama-Pacific International Exposition, has received the unique distinction of being awarded two gold medals by the International Jury of Awards.

This is but one of the exhibits of the company at the Exposition and consists of a full-sized, model home of simple, Spanish-California, bungalow design, in which electricity is made to perform practically all the domestic tasks and labors and to conduce to many of the household comforts of living. The home is completely furnished and attractively decorated, all in good taste, ready for occupancy. It comprises a large living room, dining room with breakfast alcove, bedroom, nursery, sewing room, bath, kitchen, refrigerator room and laundry. There are also an electric garage, a workshop and a small creamery. Electricity cooks, launders, sweeps, sews and fulfils countless other domestic duties; and it also heats, lights and cools the house, all these electrical conveniences being suitable for the average family and within the means of a moderate income.

One of the gold medals was awarded the "Home Electrical" by the Department of Manufactures for the completeness of the exhibit and as an exposition attraction. The second gold medal was awarded by the Department of Education in recognition of the high educational value of the exhibit. The "Home Electrical" has been thronged with visitors ever since the Exposition opened, over 700,000 sightseers having passed through its rooms up to the present time.

A NEW LINE OF SPINNING TAPES

The Lambeth Rope Corporation of New Bedford, Mass., manufacturers of Lambeth bandings, braided bands and cords, have just completed an addition to their plant giving them about 3400 more square feet of floor space, which will be devoted to the manufacture of a line of spinning tapes of the same high quality as Lambeth bandings.

New Publications

Any work noticed under this heading can be obtained, postage or express charges free, by sending the price listed to Lord & Nagle Company, 144 Congress St., Boston, Mass. A catalogue of textile books in the English language will be sent free on application.

The World's Cotton Crops, by John A. Todd, B. L., Professor of Economics, University College, Nottingham, England, 460 pages, 5 x 7 1/2; A. & C. Black, Ltd., 4 Soho Square, London, W.

The author has aimed in this work to give a condensed but comprehensive account of the production of cotton throughout the world. He states frankly in the preface that he is not a technical expert on cotton cultivation, but has gone carefully through the material and sifted it so as to include only the best available information on the subject. His experience in Egypt and his college training have fitted him for such work, and the result is a very useful handbook of cotton production. The author completed the work a few weeks before the outbreak of the great war at a time when the cotton problem facing the world was to provide an increase in the supply in order to prevent a cotton famine. The war has changed all that temporarily at least. In a separate chapter the author deals with the effects of the great conflict. The work is freely illustrated and contains a number of excellent maps. The following abstract from the table of contents shows the manner in which the subject has been treated: Introductory; The Cotton Plant: The Geographical Distribution of Cotton; India; China, Japan, and Indo-China; Russia, Persia, and Asia-Minor; The United States, Mexico; The Price of American Cotton; British West Africa; East and South-East Africa (British); Other African Colonies; South America; Long Staple American Upland; Egypt; The Anglo-Egyptian Sudan; Sea Island Cotton; Oceanica; The Uses of Cotton; The Uses of Cotton-Seed; The Effects of the War; Statistical Appendix: Production, Consumption, America, India, Egypt, and Prices.

The Development and Properties of Raw Cotton, by W. Lawrence Balls, M. A., 214 pages, 5 x 7 1/2; A. & C. Black, Ltd., 4 Soho Square, London, W. Price $2.00.

The author, formerly botanist to the Khedivial Agricultural Society of Cairo, and to the Egyptian Government Agricultural Department, has written this book in order to present the history of the development of cotton-lint. The work has a number of excellent illustrations. The contents are arranged under the following heads: The Development of Pedigree; The Development of the Plant; The Development of the Boll, I. Structural; The Development of the Boll, II. Environmental Influences; The Development of Commercial Lint; The Development of Cotton-Growing; Methods of Investigation; Tables of Statistical Data.

The Science of Fabrics and the Testing of Cloths. (Stoffkunde und Warenunterouchung); by W. Reuff, Director of Weaving in Sindelfingen-Stuttgart, 266 pages, 5 1/2 by 8 1/8; T. B. Metzlersche, Buchhandlung, Stuggart. Price $2.00.

This volume contains a condensed account of textile raw materials, the manufacture of yarn and construction of fabrics, together with the testing of textile materials, the contents being arranged under the following heads: Raw materials and yarns; How Woven Fabrics are Produced; Dyeing, Bleaching, Printing and Finishing; Testing and Appraising Fabrics. There are a number of illustrations. The volume contains a large amount of useful information regarding the various branches of textile manufacturing, making it a very valuable handbook for both students and mill men. The text is in German.

BUSINESS LITERATURE

The Fulton Cut Maker; Saco-Lowell Shops, Lowell, Mass.

A 3-page folder illustrating and describing the Fulton cut marker for identifying cloth patterns. In mills where a number of patterns of cloth are made there is often so much similarity between them that mistakes frequently occur by using the wrong warp. With the slasher equipped with the Fulton cut marker this difficulty is removed.

Psychrometric Tables for Cooling Tower Work; Wheeler Condenser & Engineering Company, Carteret, N. J.

This booklet gives a series of psychrometric tables which the publisher states are the only standard tables of this kind that have been issued in complete form. The new tables are based on readings from a large alignment chart calculated by Prof. H. L. Parr of Columbia University.

The Story of the Oldest Cotton Mill; U. S. Gutta Percha Paint Co., 19 Dudley St., Providence, R. I.

This circular gives an account of the coating of the interior of the Lippitt Cotton Mills, Lippitt Village, R. I., wth Rice's "Mill White." When the old Lippitt mill was built, whitewash was used on the walls and ceiling, and during the past hundred years scores of layers of whitewash have been applied. This was continually scaling off and requiring frequent repainting. A short time ago, B. B. & R. Knight, the present owners, had Rice's Gloss Mill White applied to all the walls and ceiling. The result is that the scaling nuisance has been permanently stopped and the glossy finish makes the interior as bright as a modern plant. Illustrations are given showing the condition of the working room at the present time.

Steam Trap Catechism; American Steam Gauge & Valve Manufacturing Co., Boston, Mass.

This sixteen page booklet begins with a series of questions and answers relative to the steam trap. In addition there is much useful information

regarding the best type of trap to be used and the economizing of steam by the use of the American Ideal steam trap. There is an imposing list of the users of the American trap in various parts of the country.

Why Trade Marks Expire With Patents; by Henry C. Thomson, 15 State St., Boston, Mass.

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OUTING AT PAWTUCKET

The second annual outing of the overseers and office staff of the Jenckes Spinning Company, Pawtucket, R. I., took place Saturday, Aug. 7, 1915, on the grounds of the Warwick Club. The party left the mill by special car and on arriving lunch was served. A ball game had been scheduled between the spinning and weaving departments, captained by Messrs. Sieferth and Stevens respectively, and amid much excitement and merriment, was finally won by the weavers' nine, by a score of 10 to 8. The winners in the other events were as follows.

100 Yard Dash: 1st., F. Morrison; 2nd., A. Meiklejohn.

Shoe Race: 1st., A. Meiklejohn; 2nd., F. Haley

OUTING OF THE JENCKES SPINNING CO.

Potato Race: 1st., R. Voisey; 2nd., J. McKinnon.

Three-Legged Race: 1st., W. Bottomley, A. Meiklejohn; 2nd., W. Montgomery, E. Hackett.

Pipe Race: 1st., O. Sieferth; 2nd., W. Bottomly.

Hop-Step Jump: 1st., A. Meiklejorn; 2nd., R. Voisey.

Fat Men's Race: 1st., F. Riendeau; 2nd., E. Franklin.

Highest single string: 1st., W. Dickson; 2nd., J. Wilson.

At five p. m. the bake was served and after the party had done full justice to the fare, Geo. Fish and J. W. Baker, general superintendent and secretary of the corporation, made appropriate remarks. A letter was read from F. L. Jackson, treasurer of the concern, expressing regret at being unable to be present, but inviting the party to be his guests at the next outing on his farm at Narragansett Pier. The committee in charge comprised: R. S. Hildreth, chairman; F. Buckley, secretary; O. Sieferth, treasurer; G. Holdsworth, A. G. Stevens and W. Dickson.

CHANGE IN GOULDS SELLING ORGANIZATION

The Goulds Manufacturing Company of Seneca Falls, N. Y., manufacturers of pumps for every service, announces a change in the management of its sales organization. Instead of having the entire organization in charge of a single executive, the selling work has been divided and is now directed by R. E. Hall, former manager of the Boston office, and W. E. Dickey, former manager of the New York office, both of whom are vice-presidents of the company. A. H. Whiteside, former sales manager has resigned.

Mr. Hall, who is now located at Seneca Falls, has charge of the general work of the department and in addition looks after the business in all the Northern, Central West and Northern Pacific States, including the territories of the Boston, Seneca Falls and Chicago offices. The export business is also under Mr. Hall's supervision.

Mr. Dickey has charge of all business in Southern, Southwestern and Southern Pacific States, including the territories of the New York, Pittsburg, Atlanta and Houston offices. He will continue to make his headquarters at the New York office at 16 Murray Street.

W. H. Hopper, who has been with the company for over twenty years, succeeds Mr. Dickey as New York manager. C. W. Fulton, formerly works manager, has been appointed manager of the Boston office.

This division of the sales work in the manner outlined is to give the Goulds' customers service of a more personal nature.

OUTING OF THE HOME BLEACH AND DYE WORKS

The seventh annual outing of the Home Bleach and Dye Works employees was held on Saturday, August 14th, at Rocky Point. Each year the company has given an outing to its employees, and this year's event was in no way inferior to those of the past. The affair was the largest ever held. The party left Pawtucket at 8 A. M. in three electric cars, which were tastefully decorated for this occasion, and arrived at the Point at 9.30. Here they were met by the manager, Edward J. McCaughey, and the party at once headed for the recreation grounds. The various athletic games were as follows:

OUTING OF THE HOME BLEACH AND DYE WORKS

100 yard Dash—Won by Wm. Hathaway.

Standing Broad Jump—Jos. McCaughey, 1st; Jos. Sherry, 2nd.

Hop, Step and Jump—John Russell, 1st; Edw. Devlin, 2nd.

Sack Race—Owen McGlone, 1st; Jas. McDade, 2nd.

Three Legged Race—Jas. McDade and John Sherry, 1st; Frank Vassett and Earl Rowbottom, 2nd.

Girls' Race, 50 yds.—Eliz. Poole, 1st; Florence Fanning, 2nd.

Girls' Base Ball Throwing—Won by Florence Nixon and Mary A. Murry.

Jump Rope Contest—Lillian Holden, 1st; Etta Mulholland, 2nd.

Potato Race—Won by Louise Murray.

After these sports came the national pastime, baseball, a game being arranged between the quilling department and the grey room. The quilling department won by a score of 7 to 5.

The party then adjourned to the dining hall where a Rhode Island clambake was served. At 6 o'clock the employees rounded up for the return trip home.

The committee of arrangements consisted of Jas. Crawley, chairman; Thos. O'Donnell, secretary; Jas. Woods; Leo McGill; Joseph Crompton; John MacConnors; Owen McGlone.

S. D. Bausher, operating the Gotham Underwear & Bleach Works, is now selling his goods direct and not through agents.

NEW PROCESS GEAR CORPORATION

A deal has just been closed between T. G. Meachem, vice-president of the New Process Gear Corporation, and officers of the Union Typewriter Company, whereby the former corporation will acquire ownership of the Monarch Typewriter plant, Syracuse, N. Y., on October 1.

The buildings of the Monarch plant cover two acres, and the surrounding land, which adjoins the property of the New Process Gear Corporation, includes an additional three acres. The main building is five stories high, is of brick and slow-burning mill construction, has a frontage of 480 feet on No. Franklin St., and extends back 350 feet to Onondaga creek.

The carrying capacity of the floors is to be increased by steel reinforcement from 200 to 300 and 350 pounds per square foot, the additional strength being necessary to provide for heavier material and machinery. After alterations the Monarch plant will be used by the New Process Gear Corporation as the job gear and spur and transmission gear department and the present plant will be devoted exclusively to the manufacture of automobile differentials.

A SILK TAG FOR CLOTHING

An educational campaign of considerable proportions has just been launched by The Silk Association of America. It intends to furnish the manufacturers of clothing, shoes and many other articles with a neat tag representing a spool of machine twist which will guarantee to the purchaser that the article has silk sewed seams and stitching.

As a result of this campaign the public will be able to give the preference to articles bearing this Silk Tag guarantee and in so doing they will consult their own best interests, because everyone knows that a seam sewed with silk will withstand a greater strain than one sewed with any other material, because silk is elastic and exceedingly strong.

It is the purpose of the Silk Association to prosecute any wrongful use of this tag, and the public will be asked to notify the Silk Association if they find any of these tags on any garment which has not been sewed with silk thread reeled directly from cocoons.

THE GRATON & KNIGHT EXHIBIT AT SAN FRANCISCO

The Graton & Knight Manufacturing Company, oak leather tanners and belt makers, Worcester, Mass., have an especially complete and instructive exhibit of leather belting and leather specialties in their booth in the Palace of Machinery, at the Panama-Pacific Exposition. This exhibit is divided into three separate and distinct divisions. The first represents the complete line of leather belting, including all the regular brands as well as the well-known Neptune Waterproof and Spartan Steamproof brands. This part of the exhibit is so arranged that visitors may easily inspect each grade of belting displayed.

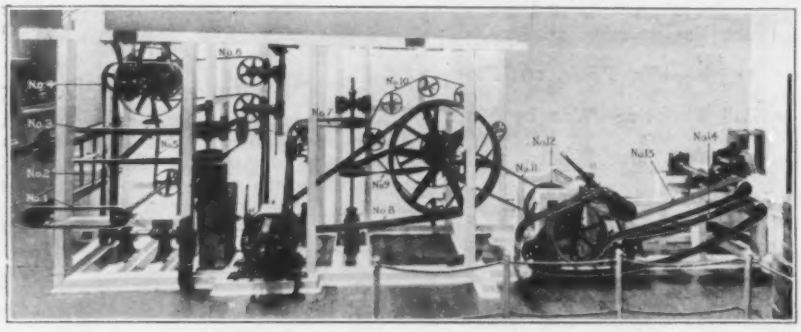
The second division is one of the most elaborate exhibits in the Machinery Palace. Here is found an interesting display of various cuts of leather, the company's different brands of lace leather, also round, twist and built-up round belting, all of which is particularly interesting to users of these various products.

It is well known that certain portions of the hide are not suited for belting purposes, yet when sorted and specially finished they are unsurpassed for manufacturing leather sundries. The major portion of this specialty exhibit is a demonstration of the manner in which the Graton & Knight people utilize the leather which is unsuitable for use in their high grade belting. It is interesting to note the great variety of leather sundries shown, principal among which are automobile and motorcycle leather specialties of every description, strapping for all purposes, trunk handles, leather aprons, packings, caskets, discs, pump leathers and washers.

EXHIBIT OF THE GRATON & KNIGHT MFG. CO. AT THE PANAMA-PACIFIC EXPOSITION

In this division is also found a representative showing of shoe counters, soles, welting and other shoe supplies manufactured by the Worcester Counter Company, also bicycle and motorcycle saddles manufactured by the Persons Manufacturing Company. Both these companies are a part of the Graton & Knight Corporation.

The third division is an operating exhibit and is divided into two sections. The first an exhibit of some dozen or fifteen different types of drives. They represent some of the most difficult drives in factory experience and are all successfully belted, not in accordance with theory, but as a result of many exhaustive tests and sixty-four years' experience in manufacturing leather belting for all conditions of service. The drives shown in the accompanying illustration of this operating exhibit are as follows:



OPERATING EXHIBIT OF THE GRATON & KNIGHT MFG. CO.

1 7/8" single strand "V" belt drive.
2 Cone drive (textile machinery).
3 Mule drive in horizontal plane.
4 Bicycle drive (cotton mill spinning frames).
5 Vertical drive with weighted idler.
6 Quarter-turn drive with two idlers.
7 Mule drive in vertical plane.
8 Five strand 1 1/4" "V" belt drive reduction ratio 7 to 1.
9 Quarter turn drive without idler.
10 Stripper drive (woolen card).
11 1 1/2" single strand "V" belt drive.
12 Matcher head drive.
13 Upper cylinder drive (high speed planer and matcher).
14 Lower cylinder drive.

In the second section of this division is a demonstration of the qualities of the Spartan brand of steamproof leather belting. Two of these Spartan belts drive through a heat chamber of 200° F. and from there into a bath of oil and water, proving conclusively the heat, oil and waterproof qualities of the belt.

The Graton & Knight exhibit is an impressive showing of their complete line of products, and quality of these products and their various uses. It also demonstrates the policy to supply not only high grade goods, but to study conditions with a view to furnishing customers the grade and construction of belting best suited to their individual requirements. To give the trade the best possible service along these lines they maintain a large engineering department thoroughly equipped to analyze any type of drive or any installation, and submit recommendations for the most efficient and economical method of transmission

The Graton & Knight Manufacturing Company invite all visitors at the Exposition to call at their booth and inspect their goods. Their representatives in charge will be glad to explain all features of the exhibit and to give suggestions in regard to the particular needs and problems of each visitor.

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GOULDS MFG. CO. OPEN PITTSBURGH OFFICE

Following out their policy of doing everything possible to better serve and improve relations with customers, The Goulds Manufacturing Company, Seneca Falls, N. Y., manufacturers of pumps for every service, have just opened a Pittsburgh office in The Henry W. Oliver Building. This office is under the management of H. H. Henderson, who has been representing the Company in Northern West Virginia and Southeastern Ohio. E. C. Wayne, who comes from the main office at Seneca Falls, has been appointed assistant manager.

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Wisconsin, Two Rivers. William S. Bremer, formerly head of the Zulu Knitting Company, and later connected with the Standard Aluminum Company, denies the report that he is interested in establishing a new knitting mill in St. Louis.

OFFICE AT THE WORKS

Thomas Leyland & Co., Readville, Mass., sole manufacturers of William Mycock's improved regulating cloth expanders and a general line of finishing machinery, have sent a notice to the trade that they have given up their Boston office at 60 India St. and moved to their works at Readville. The concentration of their offices and all departments of manufacture under one roof will give them greater efficiency and enable them to better serve their customers and the trade in general. They may therefore be addressed in future at their works, Readville, Mass.

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TREASURY DECISIONS

T. D. 35598. July 21, 1915. Drawback on hosiery. T. D. 35429 of May 24, 1915, extended to cover hosiery manufactured by the Ideal Hosiery Co., of Philadelphia, Pa., with the use of imported artificial silk.

T. D. 35600. July 21, 1915. Drawback on hats. Drawback on ladies' hats manufactured by Hirsh & Guinzburg, of New York, with the use of imported braids, velvet cloth, and other similar imported materials.

T. D. 35604. July 23, 1915. Drawback on hosiery. T. D 35429 of May 24, 1915, extended to cover hosiery manufactured by the Berkshire Knitting Mills, of Reading, Pa., with the use of imported artificial silk fiber.

T. D. 35630. August 5, 1915. Drawback on hosiery. T. D. 35429 of May 24, 1915, extended to cover hosiery manufactured by the Berkshire Knitting Mills, Reading, Pa., with the use of imported cotton yarns.

T. D. 35631. August 5, 1915. Drawback on hosiery. T. D. 35429 of May 24, 1915, extended to cover hosiery manufactured by the Dundeis Hosiery Mills, of Philadelphia, Pa., with the use of imported artificial silk yarn.

T. D. 35640. August 6, 1915. Drawback on cotton piece goods. Drawback on cotton piece goods dyed, bleached, bleached and dyed, and bleached and printed cotton piece goods manufactured by the Garner Print Works and Bleachery, of New York, with the use of imported aniline dyes or colors and cotton piece goods imported in the gray.

T. D. 35641. August 7, 1915. Drawback on ladies' vests or undershirts. 'Drawback on ladies' vests or undershirts manufactured by Walter W. Moyer, of Ephrata, Pa., with the use of imported laces and trimmings.

T. D. 35609. July 28, 1915. Drawback on hosiery. T. D. 35429 of May 24, 1915, extended to cover hosiery manufactured by the West Branch Knitting Co., of Milton, Pa., with the use of imported artificial silk.

T. D. 35610. July 28, 1915. Drawback on hosiery. Drawback on hosiery imported in the gray and dyed by the Berkshire Knitting Mills, of Reading, Pa.

Recent Textile Patents

BLEACHING Fabrics in Open Form. 1,146,461. Charles Taylor, Boston, Mass.

BOBBIN WINDING Machine. 1,146,452. Anton Rotter, Rorschach, Switzerland.

BRAIDING and Bobbin Machines, Bobbin for. 1,149,089. Eduard Schmachtl. Ober-Waltersdorf, Austria-Hungary.

BRAIDING, Lace-Making and like Machines, Spool Carrier for. 1,149,088. Eduard Schmachtl, Ober-Waltersdorf, Austria-Hungary.

CARDING ENGINE. 1,148,708. Albert H. Morton, Lowell, Mass.

DYEING MACHINE. 1,146,324. J. H. and D. M. Giles, Taunton, Mass.

DYEING, Vat. 1,148,966. John C. Hebden, Providence, R. I.

DYEING MACHINE, Warp. 1,148,695. John G. King, Burlington, N. C.

EMBROIDERING MACHINE. 1,148,557. Emil Weber, Arbon, Switzerland.

EMBROIDERING MACHINES, Fabric Tension Mechanism for. 1,148,811. Robert Zahn, Plauen, Germany.

KNITTING MACHINE, Circular. 1,145,930. William E. Smith, Milltown, N. J.

KNITTING MACHINE, Circular. 1,145,931. William E. Smith, Milltown, N. J.

LOOM ATTACHMENT. 1,146,697. Charles C. Evans, Gainesville, Ga.

LOOM, Automatic Weft Replenishing. 1,146,147. John R. Fitton, Worcester, Mass.

LOOM SHUTTLE tension device. 1,146,680. Ernest Burgess, Norwalk, Conn.

LOOMS, Reed Construction for. 1,146,478. John C. Coombs, Midland Park. N .J.

SPINNING MACHINE Wheel Mount. 1,148,741. Herbert G. Beede, Pawtucket, R. I.

SPINNING MULE, Self Acting. 1,146,450. John Rowbotham, Hyde, England.

SPINNING MACHINE. 1,146,238. Edward C. Cotter, Philadelphia, Pa.

SPINNING MACHINE, Wheel Mount. 1,146,396. Charles W. Boardman, Pawtucket, R. I.

SPINNING and Analogous Machine. 1,149,121. Edward H. Foster, Bradford, England.

SPINNING Thread and the like, Apparatus for. 1,146,048. Henry L. Brown, Paterson, N. J.

SHUTTLE CASE. 1,146,001. Fred N. LaChapelle, Beverley, Mass.

SPINNING MACHINES, Tension Pulley for Spindle-driving mechanism of textile. 1,148,745. Charles W. Boardman, Pawtucket, R. I

THREAD REEL and Needle Cushion, Combination. 1,146,473. Anna P. Brozukat, London, England.

THREAD ROLLERS, Adjustable Die-holder for. 1,146,560. Albert H. Gaess, Waterbury, Conn.

UNDERGARMENT. 1,146,092. William L. Norton, Kansas City, Mo.

UNDERGARMENT, Combination. 1,146,209. Joseph R. Sheffer, Chicago, Ill.

TEXTILE TRADE-MARKS RECENTLY FILED FOR REGISTRATION

53,871. Knitted garments. Mark: Chilproof. Owner: Fuld & Hatch Knitting Co., Albany, N. Y.

55,643. Velvets, woolens, etc. Mark: Squaredeal. Owner: The John S. Naylor Co., Wheeling, W. Va.

69,325. Lace, curtains, handkerchiefs, etc. Mark: Liberty. Owner: Liberty & Co., London, England.

72,961. Piece goods. Mark: Ve-an-es. Owner: Voss & Stern, New York.

77,564. Men's clothing. Mark: Gold Brand Owner: Milton Ochs, Cincinnati, O.

79,076. Woolen piece goods. Mark: Kaiserloden. Owner: Arthur Koenig, Milwaukee, Wis.

81,778. Petticoats, skirts, underwear, etc. Mark: Ko-i-Noor. Owner: Waldes & Co., Prague-Wrschowitz, Austria-Hungary.

82,043. Clothing. Mark: Kin. Owner: Waldes & Co., Prague-Wrschowitz, Austria-Hungary.

82,324. Billard cloth. Mark: Brunswick. Owner: The Brunswick-Balke-Collender Co., Chicago, Ill.

82,380. Crochet cotton. Mark: C. M. C. Owner: Nonotuck Silk Co., Northampton, Mass.

83,588. Underclothing. Mark: Helthwin. Owner: S. Liebovitz & Son, New York.

84,250. Knitted underwear. Mark: Flexi-Fleece. Owner: Harry E. Schwarz, New York.

85,100. Outer clothing. Mark: The Flyer. Owner: Rand Bros., Philadelphia, Pa.

85,234. Woolen textile fabrics. Mark: Hopeville Mills. Owner: Hopeville Mfg. Co., Worcester, Mass.

85,523. Sweaters, bathing suits, etc. Mark: Roperknit. Owner: Roper Knitting Co, Canandaigua, N. Y.

85,641. Cotton and woolen midsummer suiting. Mark: Tropicrash. Owner: Kahn Tailoring Co., Indianapolis, Ind.

85,946. Pile goods in the piece. Mark: Fastex. Owner: William H. Rollinson, New York.

85,973. Cotton, linen, silk and woolen piece goods. Mark: Splash voile. Owner: Benjamin F. Bailey, New York.

86,073. Wash silk. Mark: Crepe sans Gene. Owner: James Simpson & Co., Paterson, N. J.

86,074. Towels, face cloths, etc. Mark: Artknot. Owner: Star Embroidery Co., New York.

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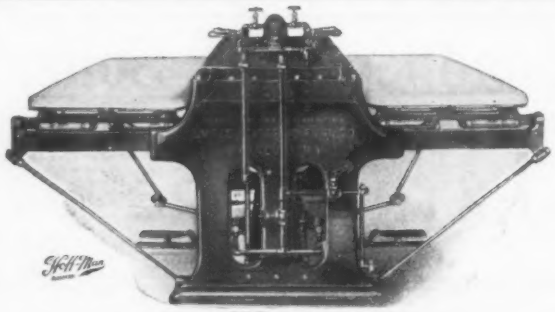

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Buyers' Index

This department is conducted for the benefit of our subscribers. The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisements. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in the classification here given such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources. Advertisers whose names do not appear under headings to which they are entitled will please notify the publishers.

Absorbent Cotton Wool Machinery.
Tatham, William, Ltd.
Air Moistening System.
——See Humidifying Apparatus.
Albone.
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Dyer, W. E. S.
Ferguson, John W.
Main, Charles T.
Myrick, J. W. H.
Asbestos Covering.
Johns-Manville Co., H. W.
Asbestos Products.
Johns-Manville Co., H. W.
Ash Handling Equipment.
Green Engineering Co.
Sturtevant, B. F., Co.
Asphalt Tanks.
Scaife, W. B., & Sons.
Auctioneers.
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Automatic Feeds for Cotton and Wool.
Leigh & Butler.
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Philadelphia Textile Machinery Co.
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Entwistle, T. C., Co.
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Belt Dressing.
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Morse Chain Co. (Silent Driving).
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Wing & Evans, Inc.
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Schwartz, L. H. A., & Co.
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Watson, Laidlow & Co., Ltd.
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Feed Water Pumps.
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Buffalo Steam Pump Co.
Goulds Mfg. Co.
Feed Water Purifiers.
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Scaife, W. B., & Sons.
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Hunt, Rodney, Machine Co.
Felting Machinery.
Hunt, Rodney, Machine Co.
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Diamond State Fibre Co.
Standard Fibre Co.
Filters.
American Water Softener Co.
Hungerford & Terry.
International Filter Co.
Norwood Engineering Co.
Permutit Co.
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Fire Alarms.
Pettes & Randall.
Fire Brick.
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Boston Belting Co.
Eureka Fire Hose Co.
Fire Hydrants.
Norwood Engineering Co.
Fire Insurance.
Home Insurance Co.
Fire Proof Doors and Windows.
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Flow Meters, Steam.
General Electric Co.
Fluted Rolls.
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Metallic Drawing Roll Co.
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Firth, William, Co.
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Leigh & Butler.
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Hunter, James, Mach. Co.
Kenyon, D. R., & Son.
Garnetts.
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Gas Blowers and Exhausters.
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General Electric Co.
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Gear Cutting Machine.
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Gearing, Silent Flexible.
Morse Chain Co.
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General Electric Co.
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Geyser Water Heater.
Sargent's Sons, C. G., Corp.
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Borne, Scrymser Co.
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Royersford Foundry & Machine Co
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Tatham, William, Ltd.
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Atkinson, Haserick & Co.
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Lavigne & Suter.
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Economy Engineering Co.
Hunt, Rodney, Machine Co.
N. Y. Revolving Portable Elevator Co.

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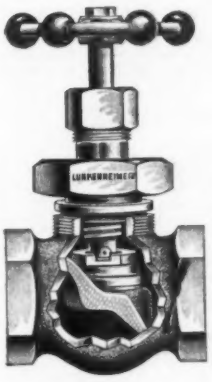
You don't throw them away!

After extended service, should the seating faces become worn, regrind—and



LUNKENHEIMER Regrinding Valves

are good as new. The original Lunkenheimer Steam Bronze, from which these valves are made is peculiarly adapted to the purpose. It has high tensile strength combined with excellent wearing qualities.

The union connection between the hub and body, provides ready means for taking the valve apart for regrinding or repairs. It also strengthens the neck of the body.

The gland in stuffing-box, seat on stem for repacking under pressure, long, perfect threads and generous proportions are other points of merit.

Ask your dealer for descriptive booklet or write for catalog.

THE LUNKENHEIMER CO.
"QUALITY"

Largest Manufacturers of High Grade Engineering Specialties in the World

3-5-54 New York Chicago **CINCINNATI** Boston London

We extend you a cordial invitation to visit our exhibits at the San Francisco and San Diego Expositions

Ample Supply of GARLAND Loom Pickers Ready to Ship the day Your Order comes.

WE carry a large stock of finished rawhide loom pickers including all sizes and styles in common use, and many which are out of the ordinary, so that we are able to fill an order for almost any picker on its receipt. These pickers are thoroughly seasoned and will wear longer than those which are used as soon as made.

Try us with your next Rush Order.

G TRADE MARK

GARLAND MFG. CO.
SACO, MAINE

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Boston Belting Co.
Johns-Manville Co., H. W.
Hose, Pneumatic.
Johns-Manville Co., H. W.
Parks, G. M., Co.
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Pearson, J. T.
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Hosiery Labels.
Kaumagraph Co.
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Hotels Statler.
Humidifying Apparatus.
American Moistening Co.
Carrier Engineering Corporation.
Cramer, Stuart W.
Parks, G. M.
Humidity Controller.
American Moistening Co.
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Cramer, Stuart W.
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Halton's, Thomas, Sons.
Jacquard Cards.
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Jenkins, E. Wheeler.
Krout & Fite Mfg. Co.
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General Electric Co.
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Parks & Woolson Machine Co.
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Sturtevant, B. F., Co.
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Sturtevant, B. F., Co.
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Emmons Loom Harness Co.
Eureka Fire Hose Co.
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Firth, William, Co.
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American Paper Bobbin Co., Inc.
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American Paper Bobbin Co., Inc.
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Heard, Smith & Tennant.
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Roessler & Hasslacher Chemical Co.
Peroxide of Sodium.
Roessler & Hasslacher Chemical Co.
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Pickers, Leather.
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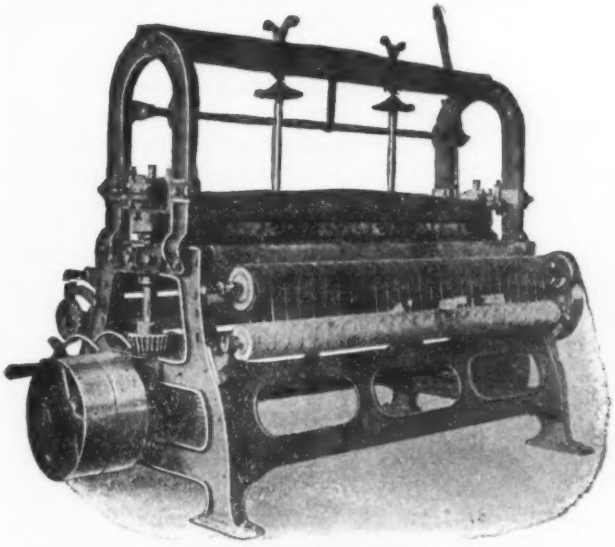

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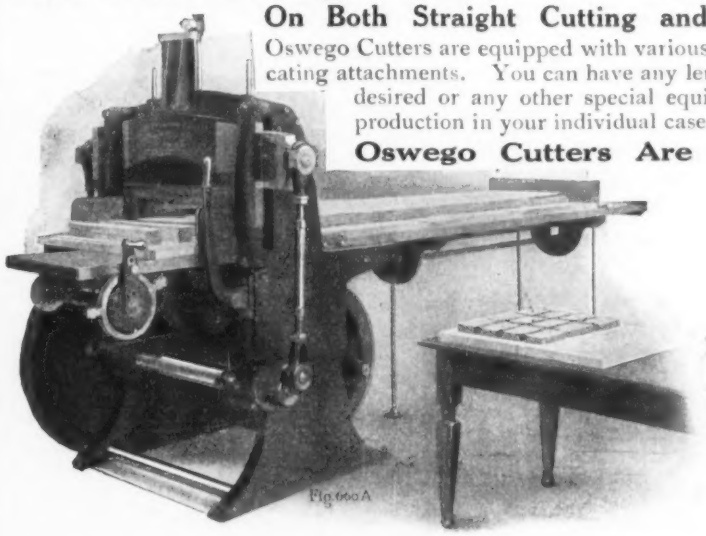
Raritan, N. J.

The New Oswego Autos Save Time and Cloth

On Both Straight Cutting and Pinking Samples

Oswego Cutters are equipped with various back gauge size duplicating attachments. You can have any length of iron-backed table desired or any other special equipment needed for rapid production in your individual case.



Oswego Cutters Are 100% Efficient

They eliminate waste of material, time and power. There is no tearing at the folds. They cut easily and quickly — either vertical or shear stroke.

Oswego Cutters are made in 90 sizes and styles for cutting Cloth, Paper, Board, Foil, Celluloid, Leather, Rubber, Cork, etc. Special sizes and styles made to order.

OSWEGO MACHINE WORKS

NIEL GRAY, Jr., Proprietor Write for Circular 660 **OSWEGO, NEW YORK, U. S. A.**

Publishers' Page

Who Pays for the Advertising?

Usually the competitor that does not advertise—through his loss of trade that the advertiser gets.

The non-advertiser reaches relatively few of the buyers in textile mills who read trade papers.

The advertiser reaches them regularly every month, and in addition many, many more, including new mills projected, those about to make improvements, etc., as well as superintendents and foremen who influence the order or who will some day be placing orders for themselves.

Advertise in the Textile World Record and reach the men that you and your salesmen cannot otherwise easily reach. Many of its subscribers take no other textile paper.

An advertisement in the Textile World Record reaches the men who have the say in spending about $250,000,000 a year for machinery and supplies, and this medium's advertisers get the bulk of it.

What the Advertisements Mean to You.

You read the Textile World Record because it gives you news of value to you about methods, machinery and supplies useful in textile industries, and you get good value for your money.

But did you ever stop to think how much the advertising section means to you?

Have you ever considered the fact that over all this country there are men doing their level best to invent or devise or improve machinery and supplies useful, and necessary, in textile mills?

And do you realize that the most progressive of them, those that have the most confidence in the good quality of the work they are turning out, are regularly paying for the privilege of telling you the news of what they are doing and can do for you? And that they are doing this through the advertising pages of the Textile World Record?

How can the advertisers of textile machinery and supplies succeed in business?

Only by rendering good service to mill owners, managers, superintendents, and buyers like you. Therefore, what they are doing is of as great news and business value to you as is any matter printed in the text pages.

The advertising pages represent the work of nearly 400 different manufacturing plants —400 different advertisers, each telling by illustrations and word pictures the news of the economies their product will effect; whether by a reduction of labor, or an increase in the amount of product you can turn out without an increase in equipment or employes; or by some saving in time or money.

Read carefully what they have to say.

"Better Returns"

Bridgeport, Pa., July 22, 1915.

Textile World Record:

Gentlemen: We wish to renew our advertisement in your valued paper for the coming year. We find we have had better returns from your paper than from any other textile paper we have advertised in, and also appreciate very much the service which goes with your contract.

Diamond State Fibre Co.
Wm. H. Taylor, Sales Manager.

A Valuable Investment

East Douglas, Mass., July 27, 1915.

Lord & Nagle Co.

Gentlemen: The information you have so kindly given us from time to time makes our subscription and advertising in your directory a very valuable investment to us.

Tally-Ho Knitting Co.

Monthly Circulation Statement

Of this edition over 6,225 copies are printed and all are needed.

The Textile World Record is a Member of the Audit Bureau of Circulations.

HYDRO-EXTRACTORS

DURABLE EFFICIENT

SATISFACTORY

AMERICAN TOOL & MACHINE CO.

Incorporated 1864 **Boston**

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BOSTON, MASS.

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MILL ENGINEER and ARCHITECT

Design, Specifications and Superintendence for Textile Mills, Industrial Plants and Kindred Structures.

Reorganizations, Valuations and Reports on Mill properties. Power Plants of every description and suggestions for their economy of operation.

Land Title Building, - Philadelphia, Pa.

John W. Ferguson Co.
Engineers and Building Contractors
Specialists in Mill, Shop and Industrial Plant Construction
United Bank Building - Paterson, N. J.

J. W. H. Myrick, A. S. H. V. E.
Inventor of the
Autoforce Ventilating System
Largest Textile Ventilating Engineers in America
Boston, Mass.

WOOL YEAR BOOK

In one volume are given outlines of woolen yarn manufacture, worsted yarn manufacture, on both English and French systems, weaving and finishing. There are numerous useful calculations, tables, recipes and notes. Brought up to date annually. 600 pages; green flexible leather. **Price, $1.00.**

Catalogue of Textile Books sent free

Lord & Nagle Co., Textile Publishers
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Laboratory Manual of Dyeing and Textile Chemistry—*Matthews.*

The method of presentation and the subject matter are the outcome of a number of years teaching on the part of the author. An elementary manual to be used in conjunction with the more general treatises on the subject. 183 experiments; test questions; 360 pages; cloth. **PRICE $3.50 PREPAID.**

Catalogue of Textile Books sent free.

LORD & NAGLE COMPANY, Textile Publishers, 144 Congress Street, Boston, Mass.

The New Bedford Textile School

This school is located in New Bedford, Mass., an attractive residential city situated on Buzzards Bay, and the largest producer of fine cotton yarns and fancy woven fabrics in this country.

Three year diploma courses in the following subjects: Cotton Manufacturing; Textile Designing; Textile Chemistry, Dyeing and Finishing; Seamless Hosiery Knitting; Latch Needle Underwear Knitting. Mechanical drawing, machine shop practice, steam and electrical engineering as applied to textile plants, given in connection with the above courses.

Special shorter courses in the above subjects, for which certificates are given, may be arranged by students desiring them.

Every instructor is a man of special training and broad practical experience.

Sixteenth year. Many graduates filling remunerative positions of trust and responsibility.

Illustrated catalogue sent free on application to the school.

William E. Hatch, A. M., President and Manager

Just Published

Woolen and Worsted

By Roberts Beaumont

640 pages 500 illustrations
40 plates

The manufacture of woolen, worsted and union yarns and fabrics is covered in one large volume. Beginning with the raw materials there are chapters on Wool Sorting; Scouring and Blending; Carding, Spinning and Twisting; Worsted Yarn Construction; Fancy Twist Threads; Fabric Structure; Weaves; Warp Preparation; Weaving; Weave Combination; Drafting; Pattern Design; Color Applied to Weaves; Compound Fabrics; Fabric Analysis and Calculations; Finishing of Fabrics.

Price $12, express paid

Lord & Nagle Company

Publishers of the Textile World Record

144 Congress St. Boston, Mass.

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CHEMISTS and ENGINEERS

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Design of Special Plants
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Control of Supplies
Elimination of Wastes

Engineering Division

Fuel Economy and Smoke Abatement
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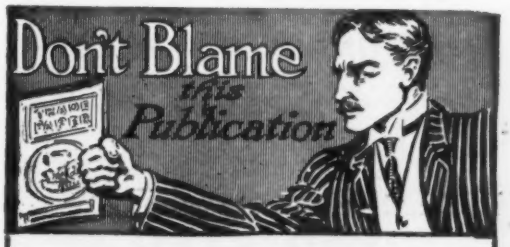
93 Broad Street - - - Boston, Mass.



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THE **Ad-Builders**
BUKEY 54 BIBLE HOUSE N.Y.

The Adman's Supply House

Save 50% by ordering direct from the Ad-builders. The experts who build the kind of Ads that say something and ***mean*** it.

The Bukey Co., 54 Bible House, N. Y.

New Weave Shed, Royal Weaving Co., Pawtucket, R. I.

EXPERT ENGINEERING SERVICE rendered in connection with all industrial engineering problems.

Plans and specifications prepared for erection and equipment of textile mills, other industrial plants, and power plants.

The reorganization of textile and industrial plants is a highly developed function.

Special reports and survey of water powers, power plants and manufacturing and other plants, looking to improvement or valuation of such properties.

CHARLES T. MAIN
Mill Engineer and Architect
201 Devonshire St., Boston, Mass.

4-2S

COTTON WASTE

By THOMAS THORNLEY

286 Pages : 60 Illustrations : Bound in Cloth, Price $3.00

Designed to be of service to all either directly or indirectly concerned with the production, uses and treatment of cotton waste.

Deals particularly with a description of the machinery and processes involved in the cleaning, opening, carding and spinning of cotton waste, treating the subject comprehensively and in detail.

The processes and machinery required for the production of condenser cotton waste yarns, are given special attention.

At the present time, no one can afford to neglect the question of waste, whether it be with regard to the reduction of its amount, or its profitable utilization.

LORD & NAGLE CO., 144 Congress Street, Boston

Money-Saving, Money-Making Opportunities

This is a special department for those who wish to buy or sell second-hand machinery, mills or mill sites, patents, etc., and for such advertisements as "Help" or "Situations Wanted." A special low rate is charged, viz., $1.00 for one-half inch, single column; $2.00 for one inch, single column, and in the same proportion for larger space. By measuring these advertisements and counting the words you will see what space is needed for your announcement. Remittance should accompany the order. No extra charge for forwarding replies sent in care of the Textile World Record. No advertisement accepted for less than $1.00.

Address: Want-Ad Dept., Textile World Record, 144 Congress Street, Boston, Mass.

WANTED Position as foreman, or as Knitter and Fixer in small ladies knit underwear mill. Can produce from one to two more shirts from each knitting machine every day than has ever been done before according to yarn used. Would like to get connected with a manufacturer who owns his mill himself with a view of becoming a partner later on. Good sewing machine fixer. 35 years old. Married. Good references. Address "Knitter and Fixer," care Textile World Record, Boston, Mass.

Wants Position as Superintendent

Ex Bradford Manufacturer and formerly teacher of designing and cloth construction at Bradford Technical College, now residing in America, wants position as Superintendent or Designer and Overseer. Accustomed to all classes of Worsteds for Men's wear. Also plain and fancy dress goods and linings. Both all wool, mercerized and all cotton, silk stripes, etc. Has done business in goods and knows requirements for markets of England, India, South America, Chili, Canada, Australia, Japan and the States, etc. Highest references. For full particulars write "Bradfordian," care Textile World Record, Boston, Mass.

Boss Spinner Wanted

for Canadian Knitting Mill. Davis & Furber machines. Strictly temperate and not afraid to work. Man about forty preferred. Good wages to right party. Address "C-9-15," Textile World Record, Boston, Mass.

FOR SALE

One 20th Century Tentering and Drying Machine, manufactured by John Heathcote & Son. Size from 45" to 65" wide. This machine can be called absolutely new as we used it only about three months. We wish to sell as we need the room.

ASTORIA SILK WORKS, Long Island City, N. Y.

ROCK MAPLE

LOGS

of The Best Quality

For Bleaching, Dyeing and Printing Rollers. Prompt delivery in any quantity. All consignments made direct from Adirondack Woods. Write for prices.

GEO. E. HARTWELL, Northville, N. Y.

HARDING & FANCOURT, Inc.

Hensington Soap Works

Soaps of Quality, Turkey Red Oil, Tuscan Softener
Soluble Oils and Olive Oil

516-18 So. Delaware Ave. PHILADELPHIA

Position Wanted

in hosiery mill as overseer of knitting or as supt. Experienced on all leading makes of hosiery machines and ribbers also loopers. Experienced on all kinds yarns, hose, half hose and ribbed goods. Can furnish reference. 31 years of age, married. Will go any place. Address "A-9-15," Textile World Record, Boston, Mass.

MACHINERY FOR SALE:--

1 Crompton & Knowles 40 inch Loom 3x3 Box.
1 Crompton & Knowles 46 inch Loom 4x4 Box.
10 Knowles 92 inch Looms 4x4 Box. 2 Butt Winders.
1 Evans 2 Screws Cold Press.
2—36 inch Bridesburg Turkish Towel Looms also 150 Hair Cloth Looms.

This machinery must be moved and will be sold cheap.

THE SCHADEWALD MILLS,
3rd and Huntingdon Sts., - - Philadelphia, Pa.

FOR SALE

8 Sipp-Cop Winders; 2 Lindley Spoolers; 2 Payne Spoolers.

Address "D-9-15," Textile World Record, Boston, Mass.

WANTED

Position with chance to advance. Young man 32 years old, 11 years experience as boss finisher, packer, cutter; also understands the adjusting of all kinds of sewing machines. Have a good general knowledge of latch and Cooper Spring Needle knitting. Am married, sober, competent with executive ability to handle most any position in manufacturing end of underwear plant. Have worked on men's women's and children's in one and two piece ranging in price from 50c. to $5.00 per garment. A first class manager of male or female help. Have good reference. Address "G-9-15," Textile World Record, Boston, Mass.

For Cotton Mill Executives

Position wanted by a man with technical and textile education and 20 years experience in cotton mills, 10 years as master mechanic, and who knows the details of all kinds of power and cotton mill machinery operation thoroughly, and also has a first class engineer's license and is a draftsman. Address "E-9-15," Textile World Record, Boston, Mass.

We are open to buy

ANILINE DYES

chemicals and pigments, large or small quantities.

SIEMON & ELTING

93 Nassau St., - New York City

Bookkeeper

Thoroughly Experienced, will audit accounts, open, close and write up books day or evening. Will also install simple and inexpensive cost systems at reasonable rates. A-1 references. Out of town work solicited. Address Martin Reilly, 5015 Pentridge St., Philadelphia. Bell phone Woodland 3853 Y.

CAPITAL WANTED

to market the most profitable patented textile machine in the world in daily use. Fully developed, ready to begin business,—unlimited field,—no competition. Address "F-9-15," Textile World Record, Boston, Mass.

Wanted: Experienced Operators

on Universal Winding Machines and Payne Spoolers in vicinity of Boston. Good Pay. Address "H-9-15," Textile World Record, Boston, Mass.

MILL ENDS AND REMNANTS WANTED

We are in the market for various kinds of cloth remnants such as Flannels, Cheese Cloths, Domestics, etc., and wish to get in touch with mills direct who can supply same.

I. L. SCHEINMAN & CO.
DETROIT, MICHIGAN

Revised and Enlarged

Color in Woven Design

By
ROBERTS BEAUMONT

A thoroughly comprehensive treatise on the theory and principles of textile coloring, woolen, worsted, cotton and silk.

396 Pages : 367 Illustrations : 39 Colored Plates

Price Reduced to $6.00

Express Charges Prepaid

LORD & NAGLE COMPANY, 144 Congress Street
BOSTON, MASS.

Send for new free catalog of textile books

WOOLEN MILL MACHINERY
FOR SALE

3 48" Bramwell Card Feeds.
2 60" Bramwell Card Feeds.
4 60" Bates Diagonal Feeds.
1 Belgian Condenser, 140 end, double apron.
4 Hetherington Condensers, 140 end, double apron.
2 Hetherington Condensers, 160 end, double apron.
1 140-spindle Curtis & Sons Patent Mule.
1 350-spindle Johnson & Bassett Waste Mule, 2⅛" gauge, for spools of 35 ends each.

The above are practically new machines, and in first class condition.

Second Hand

1 Hetherington Condenser, 140 end, single apron.
1 Hetherington Condenser, 70 end, double apron.

For particulars and prices, address

MANUFACTURERS EQUIPMENT CO.
100 Summer Street BOSTON, MASS.

SENT FREE

Complete Catalog of all Textile Books in English language. Lord & Nagle Co., Boston, Mass.

DYEING RECIPES
For Sale

The recipes for dyes of all colors and shades, recipes that have been in successful use for 50 years, are now, through the death of the only man who knew and has used them, offered for sale either separately or collectively. Samples of dyeings can be shown to interested parties.

For details address "B-9-15," Textile World Record, Boston, Mass.

MILL PROPERTY
FOR SALE

The John L. Ross & Son mill at Eagleville, Conn.

Cotton mill, 10,000 spindles, 172 looms, fully equipped boiler house and new boiler. Electric lighting plant and excellent water power. Store house. Blacksmith shop. Saw mill. Ice house. Store, and Post Office in store. Superintendent's house. Boarding house. 16 tenement houses, 2 tenements in each house. About 20 acres of land. Established in 1844. Always been a money maker, right at R. R. station, spur tracks right to door.

This property is offered for sale by the Executor to settle Estate. For further particulars enquire of

E. A. WINTER, *Executor*,
Willimantic, Conn.

COMPLETE KNITTING MILL FOR SALE

The Sakonnet Knitting Mills have been making high grade underwear for men and boys since 1910. The building is modern and first class in every way and the interior was recently thoroughly cleansed and painted.

The building is brick, two-stories and basement with a floor space of 17,625 square feet. Inside measurements of building over 100 feet long and more than 58 feet wide. Thoroughly sprinkled and heated throughout. There are 23,196 sq. ft. land.

Operated by electric power supplied by local electric company.

MACHINERY

All machinery is in first class condition having been properly cared for and can be seen at any time. In addition to all of the necessary auxiliary machinery for the manufacture of underwear for men and boys, including modern office equipment, there are:

22 Scott & Williams Knitting Machines
11 Cooper Spring Needle Machines
7 Tiffany & Cooper Cuff Machines
1 Leighton Collar Stripping Machine
14 Union Special Machines
10 Willcox & Gibbs Lock-Stitch Shirt Finishing Machines
5 Payne 40-end Winders
1 Payne 24-end Winder
1150 Bobbins for Payne Winders

LOCATION

The plant is located at Pawtucket, R. I., midway between Providence and Pawtucket, making high grade help easily available. Many of the present employees have been with the firm several years. The property is offered in its entirety as a going plant and I should be glad to receive any reasonable offer.

WALTER H. STEARNS, Receiver

Sakonnet Knitting Mills, Pawtucket, R. I.

Situations Wanted

Manufacturers who are in need of Superintendents or overseers for any department of mill work may learn of suitable men upon application by mail or telephone to C. T. DONLEVY, care Textile World Record, 144 Congress Street, Boston, who will give prompt attention to their requirements without charge.

Assistant Designer; has worked on men's vests, overcoatings, suitings, woolen goods, ladies' fancy dress goods and worsted goods; familiar with Knowles, Crompton, Thayer and English looms; good reference; will not go West, South or to Canada.
6508, Textile World Record, Boston, Mass.

Boss Dyer in Woolen Mill; has worked on sulphur, direct, acid, basic and developed colors on cotton yarn; chromate, acid, union and resist colors on all grades of worsted yarn; familiar with Klauder-Weldon dyeing machines and hand kettles; 24 years of age; will not go to Canada; good reference.
6510, Textile World Record, Boston, Mass.

Boss Carder in Cotton Mill or Second Hand; has worked on ducking, sheeting and in mills making from 7s to 90s yarn; familiar with Saco, Lowell, Howard, Bullough, Whitin, Woonsocket, D. and B. and Hetherington machines; 35 years of age; married; will not go West, South or to Canada; good reference.
6511, Textile World Record, Boston, Mass.

Fixer on Davis and Furber Mules or might consider position in charge of spinning in woolen mill; has worked on all classes of heavy and fine work; 30 years of age; married; will not go to N. J., West, South or to Canada; good reference.
6512, Textile World Record, Boston, Mass.

Boss Carder in Woolen Mill; has worked on all grades of goods; familiar with Davis & Furber and Lombard cards; will not go West, or South; 42 years of age; married; good reference.
6513, Textile World Record, Boston, Mass.

Office Manager, Pay Master or Accountant; has good references; prefers Pennsylvania; good reference.
6514, Textile World Record, Boston, Mass.

Cloth Room Percher or second hand in dry finishing room in woolen mill; has worked on all grades of both woolens and worsteds, uniform and billiard cloth, chinchillas, fancy worsteds, etc.; familiar with Parks & Woolson, Curtis & Marble, Greene and most all makes of shears; will not go to Vt., West, South, or to Canada; 26 years of age; good reference.
6515, Textile World Record, Boston, Mass.

Boss Weaver in Woolen Mill; has worked on fancy worsteds, woolens, dress goods, overcoatings and kerseys; familiar with Knowles and Crompton looms; 50 years of age; married; will not go West or South; good reference.
6516, Textile World Record, Boston, Mass.

Superintendent of Underwear Mill; has worked on all kinds of underwear; familiar with all American machines; 40 years of age; married; will not go South or to Canada; good reference.
6517, Textile World Record, Boston, Mass.

Boss Weaver in Cotton Mill; has worked on automobile tire fabrics; familiar with Whitin, Mason and Crompton looms; 29 years of age; good reference.
6518, Textile World Record, Boston, Mass.

Boss Weaver in Woolen Mill; has worked on all kinds of ladies' and men's suitings and overcoatings; familiar with English and Knowles looms; 45 years of age; married; good reference.
6519, Textile World Record, Boston, Mass.

Boss Dyer in Woolen Mill; would consider position as dyeing laboratory chemist or mill chemist; familiar with fast colors on cotton, woolen, worsted, raw stock, yarn and piece, also all kinds of hosiery; familiar with all kinds of dyeing machines; 28 years of age; married; will not go South or to Canada; good reference.
6520, Textile World Record, Boston, Mass.

Superintendent of Cotton Mill; has worked on crochet and satin cotton bed spreads especially; familiar with Whitin, Draper, Woonsocket, Saco, Lowell, Crompton, Knowles, Halton and jacquard machines; 34 years of age; married; will not go to Southern Alabama or Georgia; good reference.
6521, Textile World Record, Boston, Mass.

Overseer of Drawing, English, Cone or French system. Would consider position as overseer of spinning, English system, if with drawing, familiar with drawing and spinning machinery; has worked on Australian, New Zealand, Iceland, and domestic wools, cotton merinos, mixes for underwear trade and counts from 1s to 60s; 44 years of age; married; good reference.
6522, Textile World Record, Boston, Mass.

Overseer of Mule or Frame Spinning; has worked on crepes, voiles, poplin and all kinds of fine and coarse goods; familiar with Asa Lees, Dobson & Barlow, all makes of English mules; Howard & Bullough, Fales & Jenks and Whitin spinning frames; 38 years of age; married; will not go to Vt., Pa., West or South; good reference.
6523, Textile World Record, Boston, Mass.

Boss Finisher in Woolen Mill; has worked on beavers, kerseys, all wool cassimeres, cotton mixed cassimeres, blankets, fine fancy worsteds, cheviots and piece dyes; familiar with all makes of finishing machinery; 33 years of age; married; will not go to Canada; good reference.
6524, Textile World Record, Boston, Mass.

Second Hand Dyeing; has worked on worsted piece goods, worsted yarns, unions and cotton yarns; familiar with Klauder-Weldon and all regular dye house equipment; 24 years of age; will not go West, South or to Canada; good reference.
6525, Textile World Record, Boston, Mass.

Overseer of Spinning in Woolen Mill; has worked on all kinds of goods; familiar with Johnson & Bassett and Davis & Furber mules; 32 years of age; good reference.
6526, Textile World Record, Boston, Mass.

Boss Carder in Woolen Mill; has worked on wool, shoddy and cotton stock making dress goods, flannels and all kinds of cloth that could be made from this stock; all kinds of mixes; familiar with Barker, Davis & Furber condensers; Cleveland rub rolls; Austrian system; all kinds of self feeds and cards; 29 years of age; married; will not go South or to Canada; good reference.
6527, Textile World Record, Boston, Mass.

Superintendent of Knitting Mill or would consider position as assistant superintendent; has worked on all grades of sweater coats and mittens, wool and worsted hosiery, also cotton mercerized and a little on silk; familiar with Grosser, Stafford & Holt, Brinton, Spiers and Grieves machines; Scott & Williams, Banner, Mayo loopers and different types of ribbers; 24 years of age; would prefer Canada; good reference.
6528, Textile World Record, Boston, Mass.

Boss Weaver; has worked on worsteds, woolens, dress goods and men's wear; familiar with Knowles, Crompton, fancy and cam looms; English and Draper looms; 41 years of age; married; will not go West, South or to Canada; good reference.
6529, Textile World Record, Boston, Mass.

Overseer of Dyeing in Woolen Mill; has worked on all ginds of goods, piece dyes, wool dyes, yarns, all kinds of colors, and indigo vats; 50 years of age; married; will not go West, South or to Canada; good reference.
6530, Textile World Record, Boston, Mass.

Assistant Designer or boss weaver in small mill; has worked on cotton, woolen and worsted goods; 22 years of age; familiar with dobby, Knowles, Crompton and Thayer looms; will not go West or to Canada; good reference.
6531, Textile World Record, Boston, Mass.

Superintendent of Cotton Mill; has worked on absorbent cotton and cotton piece goods; familiar with all classes of bleaching and finishing machinery; 49 years of age; good reference.
6532, Textile World Record, Boston, Mass.

Finishing Percher; has worked on woolen dress goods, suitings, overcoatings, cloakings, khaki overcoatings for British government; 27 years of age; will not go to Me., Vt., Pa., West, South or Canada; good reference.
6533, Textile World Record, Boston, Mass.

Assistant Superintendent or Overseer in Hosiery Mill; has worked on cotton, worsted and silk hosiery; familiar with Richter and Leiberknecht flat frames; Huse, Payne, Camless and Universal Winders; is also a machinist draftsman and has done considerable mechanical engineering; 44 years of age; married; will not go to Pa., N. J., West, South or to Canada; good reference.
6534, Textile World Record, Boston, Mass.

Assistant Superintendent Woolen or Worsted Mill; would consider position as assistant designer; has worked on worsted men's wear, cotton worsteds, woolens, overcoatings, of all kinds and novelties; also familiar with worsted yarn manufacturing; 27 years of age; good reference.
6535, Textile World Record, Boston, Mass.

Superintendent or Boss Knitter; has worked on all grades of first class underwear and hosiery; familiar with Scott & Williams, Nye & Tredick, and Cooper knitting machines; all kinds of sewing machines and loopers; 33 years of age; will not go to Pa., N. J., West, South or Canada; good reference.
6536, Textile World Record, Boston, Mass.

Salesman on Hosiery; has worked on all grades of hosiery; can manipulate any circular machine; 25 years of age; will not go to Canada; good reference.
6537, Textile World Record, Boston, Mass.

Boss Weaver in Cotton Mill or would consider position as boss weaver and assistant designer; has worked on all kinds of dobby and jacquard work; familiar with Crompton, Knowles, Whitin, Mason Kilburn, Lincoln, Colvin and Stafford looms; 37 years of age; married; will not go West or South; good reference.
6538, Textile World Record, Boston, Mass.

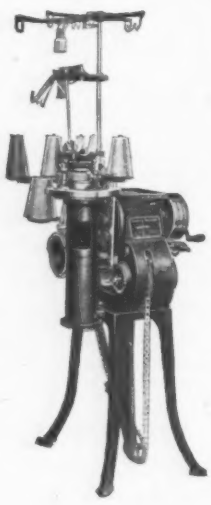
Second Hand of Wet Finishing or would consider position as boss fuller; has worked on all classes of woolen goods and cotton warp goods; familiar with Rodney Hunt, Greene nappers, James Hunter, Curtis & Marble, Davis & Furber and Parks and Woolson machines; 31 years of age; good reference.
6539, Textile World Record, Boston, Mass.

Overseer of Knitting; has worked on 1/20 to 2/100 yarns and 2/48 silk goods; familiar with Crane, Scott & Williams, Wildman, Huse and various other machines; 45 years of age; married; good reference.
6540, Textile World Record, Boston, Mass.

Boss Finisher; has worked on all grades of woolens and worsteds, uniform and carriage cloths, shawls, dress goods, chinchillas and worsted serges; familiar with Hunter Bros., Parks & Woolson, Curtis & Marble, Volker and Gessner presses; 32 years of age; will not go to Canada; good reference.
6541, Textile World Record, Boston, Mass.

Boss Carder in Woolen Mill; has worked on kerseys, meltons, cassimeres, dress goods, men's wear, satinets, nub yarn and woven felts; familiar with all makes of American cards; 38 years of age; married; will not go South; good reference.
6542, Textile World Record, Boston, Mass.

Why Not Have Your Plant Flexible?



It is no longer necessary to buy hosiery machines of special diameter that can be used for only one class of goods.

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California, Berkeley. Thomas Cartwright, of 1940 Shattuck Ave., who it is said was previously engaged in silk manufacturing in Paterson, will establish a silk factory in Berkeley, backed by Oakland and Berkeley investors, to manufacture thread, laces and silk woven goods.

*Michigan, Laurium. Steve Stiglich, formerly of Milwaukee, who has been previously reported interested in establishing a small hosiery knitting plant in Laurium, has secured quarters and plans to manufacture wool, worsted and cotton hosiery, 84 to 160 needle. The equipment has not been purchased. Business will be done under the name of the Stiglich Knitting Company. Mr. Stiglich can be addressed care of the Palace Hotel Laurium, Mich.

*North Carolina, Hendersonville. The proposed new hosiery knitting plant in which James Gray of Johnson City, Tenn., has been reported interested, will be built if the people of Hendersonville will donate a site. The prospects are good for the donation of suitable property and Mr. Gray will probably build a hosiery mill for making misses' hosiery. It is understood that the product of the plant, if the mill is built, will be finished by the Freeze-Bacon Hosiery Mills.

*Pennsylvania, McAdoo. Good progress is being made on the construction of a brick mill to be occupied by the new McAdoo Knitting Mill. As noted in previous reports the manufacture of women's and children's underwear will be started in October with 10 knitting and 8 sewing machines.

*Pennsylvania, Philadelphia. The Alma Hosiery Mills, recently reported by us as starting up at 505 W. Lehigh Ave., is owned and operated by F. H. Seimes, on women's silk and art silk hosiery, with 10 knitters, 1 seamer and 1 looper, the plant being run by electricity and the production sold direct.

*Pennsylvania, Pottsville. Frank Kaiser, who was recently reported interested in starting up the plant for the manufacture of women's underwear, has purchased an old knitting mill and is making repairs to the property. Some new equipment will be added and Mr. Kaiser will operate 14 knitting machines and 21 sewing machines.

*Tennessee, Soddy. Construction contract for the erection of a mill building for the new Soddy Hosiery Mills has been awarded. Plans call for a brick building, 100 by 50 feet, with a boilerhouse, 40 by 18 feet. This enterprise is a branch of the Richmond Hosiery Mills, Rossville, Ga. As noted in a previous report the initial equipment will be 100 knitting machines and the product will consist of seamless hosiery. Garnett Andrews of Chattanooga, is the buyer.

Canada, Ontario. Toronto. Allen Bros. Company, Ltd., recently organized as noted, succeed Allen Bros. Company, 817 Gerrard St., E., manufacturers of infants' and children's hosiery. They are increasing the equipment to manufacture in the future infants', children's and men's cashmere and silk and cashmere hosiery. They also plan to add a department for weaving netting. The capital stock of the company is $40,000. Chas. R. McKenzie is president, K. W. Allen, vice president; A. N. Huestis, treasurer, and K. W. and J. M. Allen managers and buyers. It is possible that a dyeing department will be added later on.

Connecticut. Norwich. The Lion Mills of Hartford have purchased the equipment of the Coronet Knitting Company who formerly manufactured shaker knit sweaters in Norwich, and have moved the machinery to Hartford. The Lion Mills will in the future make shaker knit sweaters as well as cardigan stitch. The Coronet Knitting Company was owned by the late C. W. Briggs, whose death was regretfully recorded several months ago. Recently the plant has been idle and for sale.

Georgia, Columbus. Another story is being built on one of the buildings of the Georgia Mfg. Company, manufacturers of cotton yarns and hosiery. The addition will cost about $8,000 and will give more space for the dyeing department and opening room.

*New Jersey, Boonton. The addition to the plant of the Boonton Hosiery Company on which work was started in the spring is practically finished. As noted in a previous report the capacity is to be doubled. George E. Fichtner is president, treasurer and buyer.

New Jersey, Vineland. The contract has been awarded to Hugh Miller of Riverside, N. J., for building an addition at a cost of $26,000 to the knitting mill formerly operated by John Karl, which was recently taken over by William F. Taubel, Inc., hosiery manufacturers of Riverside.

*New York, Johnstown. The Johnstown Knitting Mill Co., Inc., contemplates additions to its power department of either steam or electric power equipment. This is made necessary by the increasing business. The plant has just resumed manufacturing after an idleness of one week, due to a defective boiler.

New York, New York City. Six new machines for manufacturing caps are being installed in the plant of the New York Crown Knitting Works, 66 Greene St.

New York, Sherburne. A new generator to drive the sewing machine tables is to be put in the plant of the Canasawacta Knitting Company. The plant has been shut down for a period of one month.

*New York, Sidney. The equipment of the Jersey Silk Mfg. Company has been moved into the new building recently completed. Electric power is purchased. This concern was organized only a short time ago to manufacture silk jersey cloth and silk netting.

New York, Utica. Contracts have been awarded by the Oneita Ktg. Mills for a $25,000 addition to be completed by October. It is understood that another story 270 by 110 feet is to be built on No. 4 mill, to be used as a knitting department. The company anticipates excellent business this fall, and is preparing to make a large increase in its output of union suits.

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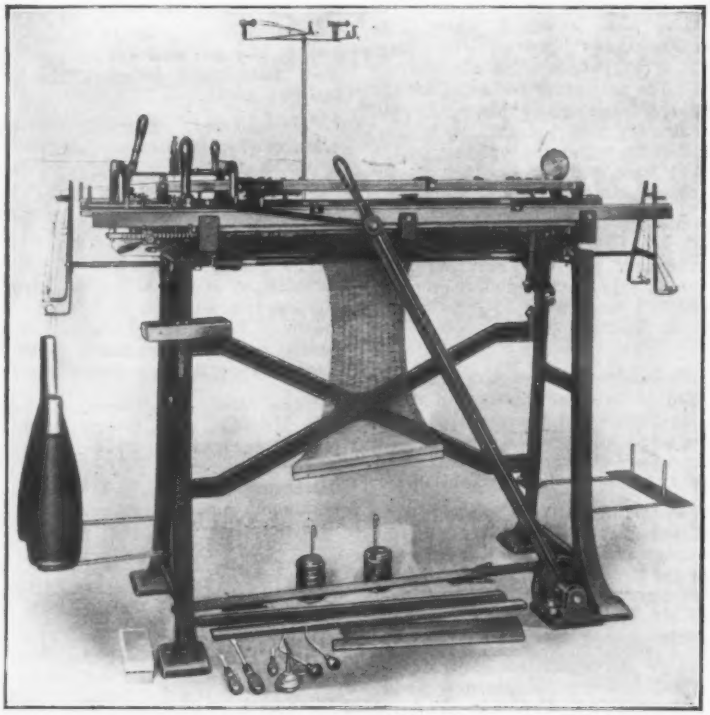

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*North Carolina, Ashboro. Contracts for the construction of the new addition to the plant of the Acme Hosiery Mills have been awarded. About $35,000 will be invested and the plant will be practically doubled as noted in a previous report. The new building will be of brick construction, 2 stories high, 100 by 60 feet, and will cost from $8,000 to $10,000. Machinery equipment will include 100 knitting machines. Electric power will probably be used. The Acme Hosiery Mills manufacture women's seamless hosiery from 14s to 20s yarns on present equipment of 190 knitting machines. D. B. McCreary and T. H. Redding, the president and treasurer, attend to the buying.

North Carolina, Charlotte. Contract has been awarded by the Defiance Sock Mills, a new concern which recently began manufacturing men's half hose on a small scale at 1,400 So. Boulevard, for a $15,000 plant. Moorhead Jones and K. S. Tanner are the proprietors. Electric power will be used and a boiler will be installed for finishing.

North Carolina, Hickory. The Elliot Knitting Mills, Inc., are adding equipment in the new 2-story building, 75 by 75 feet, which has been constructed as an addition to the old plant. Twenty-four new knitting machines are being added.

Pennsylvania, Fleetwood. Charles A. Wanner, a manufacturer of men's seamless cotton and silk half hose, has started up the local branch after making an improvement in the power plant.

Pennsylvania, Harrisburg. Additional machinery is being installed in the plant of the New Idea Hosiery Company, Inc., manufacturers of men's and women's seamless hosiery.

Pennsylvania, Harrisburg. An increase has been made in the capital stock of the Morehead Knitting Company from $100,000 to $150,000. Men's and women's cotton and silk hosiery is manufactured.

*Pennsylvania, Mifflintown. W. I. Nestler is enlarging the size of his Juanita Hosiery Mills, by the erection of a new addition in which he will install sufficient machinery to increase his equipment 50 per cent. The plant, at present, is running day and night on women's all silk and boot silk hosiery, which he sells direct.

Pennsylvania, Mohrsville. James H. Wagner & Company, manufacturers of ladies' cotton ribbed underwear, will install some new equipment.

Pennsylvania, Philadelphia. Alterations and additions are to be made to the plant of Querns Brothers, manufacturers of women's and misses' knitted underwear at 1,916 N. Fourth St., consisting of a 5-story building of brick and concrete, 13 by 13 feet. W. E. S. Dyer, Land Title Building, is the engineer and architect in charge of the operation.

Pennsylvania, Philadelphia. George Bannister, manufacturer of fancy knit goods, skirts, etc., with 12 knitters and 15 sewing machines at 5155 Wakefield St., Germantown, is installing six Tricot machines on which he is going to make a line of silk fabrics for gloves, petticoats, etc., the production to be sold direct.

Pennsylvania, Philadelphia. The Eagle Knitting Company, operating six knitters and 10 sewing machines on bathing suits and jerseys, have removed their plant to Hancock and Huntingdon Sts., where they have secured larger quarters with a view to increasing their equipment and turning out a larger production. Finkle & Schalcross are the proprietors.

Pennsylvania, Reading. The Berkshire Knitting Mills, manufacturers of women's full fashioned mercerized and silk hosiery have started work on the foundation for a new $100,000 mill at Wyomissing. The new building will be 240 feet long and 5 stories high.

Pennsylvania, Schuylkill Haven. Another story is being built on the plant of the Coldren Knitting Mills on Union St. The enlargement will be 70 by 36 feet, and will enable the company to add largely to its production.

Pennsylvania, Souderton. M. B. Bergey Company, manufacturers of men's and women's seamless hoisery, are making good progress on the addition recently reported. It has been noted that 50 new 176-needle knitters for making split foot hosiery will be installed.

*South Carolina, Union. Another building has been erected for the Gault Mfg. Company, which will be used for finishing. Men's and women's hosiery is manufactured.

Wisconsin, Milwaukee. A new 6-story and basement building 60 by 120 feet is to be built at Milwaukee and Chicago Sts., by the Phoenix Knitting Works, Inc., to increase their manufacturing facilities. Details of new equipment have not yet been decided. They are manufacturers of men's and women's full fashioned and seamless hosiery and fancy knit goods, on present equipment of 350 flat knitting machines, 25 sewing machines, yarn and garment dyeing, bleaching and finishing equipment. Herman Gardner is president and buyer and E. C. Mason, treasurer.

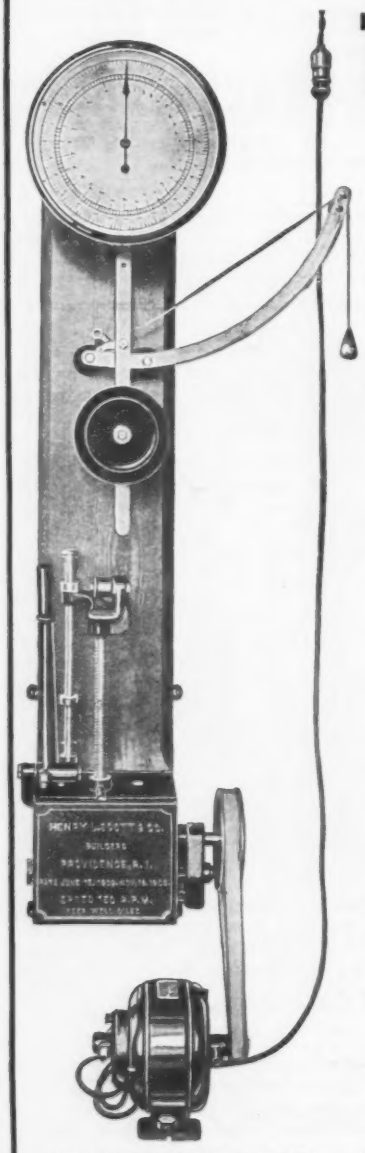
*Wisconsin, Sheboygan. The new 2-story and basement warehouse and office building of the Hand Knit Hosiery Company has been completed and is being occupied by the concern.

*Canada, British Columbia, Vancouver. The new Universal Knitting Company has begun manufacturing at 624 Smythe St., making sweater coats, fancy knit goods, etc. A. C. Cohen, formerly with the Pride of the West Knitting Mills, is manager. There are 10 knitting machines and 4 sewing machines in the plant.

New Jersey, Hammonton. The knitting mill of the Cottrell Company has been taken over by William F. Taubel, Inc., of Riverside, N. J., and will be operated as a branch of the Riverside plant.

*New Jersey, Millville. The branch knitting mill established here by W. F. Taubel, Inc., of Riverside, N. J., has begun manufacturing. As noted in previous reports, branches are also being established at Lebanon and Reading, Pa., and Camden, and Trenton, N. J.

MOTOR DRIVEN TESTERS



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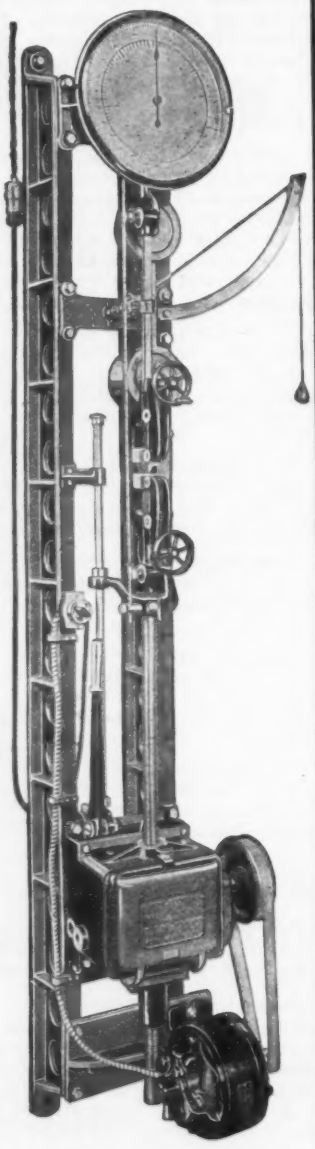

HENRY L. SCOTT & CO.

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*New York, Ellicottville. It is expected that manufacturing will be started in a few days at the new factory building erected here for the Lander & Watson Hosiery Company, who are moving from Perry, N. Y. A 2-story brick mill with a separate boiler and engine room, has been constructed and is being equipped to manufacture 25-cent to 50-cent grades of silk and artificial silk hosiery, starting with 50 machines and dyeing and bleaching equipment. They have made excellent selling arrangements and it is expected the business will increase rapidly. The local Business Men's Association is now negotiating with two other concerns with a view to having them locate here.

*Pennsylvania, McKeansburg. It is reported that the new knitting plant being established here by C. A. Bolich and Robert P. Mengel, has begun operations. As noted early in June, they will manufacture 160 needle half hose, under the style of the McKeansburg Hosiery Mills, on an equipment of 62 knitting machines and 4 sewing machines, operated by electric power. Later it is expected that a dyeing and finishing department will be established.

Pennsylvania, Scranton. Manufacturing will be resumed in a few days at the plant of the Scranton Textile Company which has been closed for several months. The company was recently reorganized. At first employment will be given to about 100 hands, but it is expected that the full complement of about 600 or 700 hands will be engaged before many weeks. Thomas F. Trimble is the new manager.

Wisconsin, Oconto. The local branch of the Marinette (Wis.) Knitting Mills, has resumed manufacturing after a shut-down of several months.

*Massachusetts, Millbury. Equipment purchased by the Mayo Woolen Company from the Ramshorn Mill at West Millbury, consists of 2 sets of cards and 4 mules. This equipment will be installed in No. 4 Mill at Millbury as soon as possible. The No. 4 Mill was purchased by the Mayo Woolen Company about three years ago and it was formerly known as the Worcester Knitting Mill.

*Massachusetts, Northboro. New machinery will be installed in the Woodside Mills, which have just been taken over by new interests and are being repaired preparatory to being started up under the management of John P. Leary. Included in the new equipment there will be several new looms, a new washer, dye tubs, extractor, and dryer. The mill will probably be operated under the name of the Taylor Mfg. Company. They are not ready to make any further statement at present regarding the new company.

Massachusetts, Rochdale. Work has been started tearing down the old bleach house of E. G. Carlton & Sons, manufacturers of white flannels. The old building is to be replaced by a new and larger building. About a year ago a large new weave shed was constructed by E. G. Carlton & Sons. The mill is closed at present for the annual vacation of two weeks.

Massachusetts, West Millbury. The Mayo Woolen Company of Millbury has purchased the cards and mules in the Ramshorn Mill and will remove this machinery to the Mayo plant at Bramanville. It has been noted previously that the Mayo Woolen Company is consolidating and improving its plant, and utilizing the old knitting mill property. Charles Day is conducting a wool scouring business in the Ramshorn Mill and did not need the carding and spinning equipment.

*New Hampshire, Rochester. Improvements in the weaving department of the Rochester Woolen Company, recently noted, consist of the installation of six new looms to replace old looms which they could not use.

*New Hampshire, West Swansey. The machinery to be installed in the factory on the west side of the river, formerly used as a box shop, which has been leased by the Homestead Woolen Mills, H. W. Bron, proprietor, will consist only of looms. The present carding and spinning departments will be operated night and day.

Pennsylvania, Philadelphia. The Peerless Company, 1845 E. Willard St., dyers and bleachers of skein silks, silk hosiery and bleachers of woolen hosiery, have increased their bleaching departments to double the capacity. They have sufficient business on hand on both dyeing and bleaching to run them full time.

Pennsylvania, Philadelphia. Norman Finlayson, formerly with the Standard Hosiery Dyeing & Finishing Company, has been employed by the Phoenix Dye Works at Clearfield & Witte Sts. to take charge of their finishing department which has recently been improved and greatly by the installation of new machinery. The owners of the plant state that they are now in a position to take on all classes of dyeing, bleaching and finishing of hosiery and turn it out at the quickest possible moment.

*Rhode Island, Pawtucket. Sixteen new looms are being added to the equipment of the Shannock Narrow Fabric Company, manufacturers of fine plain and fancy tape, giving them an equipment of 52 narrow fabric looms. John Crowther is treasurer and buyer.

Rhode Island, Pawtucket. Good progress is being made on the addition to the plant of the Acme Finishing Company. The addition will be four stories high, 160 feet long, with an ell, 60 by 67 feet, 1-story high. As noted in a previous report an increase of about 25 per cent. will be made in the capacity.

Rhode Island, Pawtucket. The Eureka Dyeing & Bleaching Company has been incorporated with capital stock of $12,000 by Harry E. Kenworthy, William Rogers, and William W. Collins, all of Pawtucket. The concern does a business of dyeing and bleaching on commission in the dyehouse on Japonica St. here, formerly operated by the Hope Webbing Company and started business April 1, 1914. The plant is to be increased. Harry E. Kenworthy has been elected president; William W. Collins, treasurer; and William Rogers, superintendent. William W. Collins is connected with the Collins Bros. Machine Company.

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MEETING OF NATIONAL ASSN. OF COTTON MANUFACTURERS

(Continued from page 112)

SCARCITY OF DYES AND CHEMICALS DURING THE PRESENT WAR

I. V. Stanley Stanislaus, Ph.D., 848 Drexel Building, Philadelphia, Pa.

Dyers of the olden times depended entirely upon the so-called natural dyestuffs, of which the number of useful ones was limited. In those old days the young dyer was seriously handicapped in his search for information, for the dealers in those natural dyestuffs knew little, if anything, about their application, and as there were no publications on the subject, the young man's only source of information was from older dyers.

A decided change took place between the years 1856-1860, when it was discovered that coloring matters, which surpassed any of the natural dyestuffs in brilliancy, could be manufactured from the products of the distillation of coal tar. Many of these so-called coal-tar colors were discovered and put upon the market, and, as the manufacturers knew more about their application than the dyers, it was to the advantage of the former to circulate this information. As a result, the dyestuff manufacturers published sample cards and books containing dyed samples and the necessary information for the successful application of their colors. At the present time enormous sums are spent every year by them in the investigation and publication of the best methods of applying the colors they place upon the market.

In more recent years numerous books have been published on the various branches of textile coloring; this, with the establishment of textile schools, makes it possible for bright young men to become expert dyers, without assistance from friendly dyers

CLASSIFICATION OF ARTIFICIAL DYESTUFFS

For the practical dyer there is but one satisfactory method of classifying the artificial coloring matter, i. e., according to their action upon different fibers; in other words, according to their application. Therefore, in our study of them we shall consider the following classification:

1. Basic colors.
2. The cosins and related dyestuffs, known as the phthaiic anhydride colors.
3. Acid colors.
4. Direct cotton colors.
5. Sulphur colors.
6. Mordant colors.
7. Mordant acid colors.
8. Insoluble azo or ingrain colors.
9. Reduction vat colors.
10. Aniline black.

DOMINANCE OF THE GERMAN INDUSTRY

In all this annoyance, loss, and uncertainty, why do we not have an American coal-tar chemical industry, capable of meeting the nation's demands, self-contained and independent of foreign control, utilizing our native raw material?

A careful analysis of the situation shows that not only is the American supply and the limited American production of coal-tar dyestuffs completely dominated by the American industry, but that this is the case throughout the world. Even countries such as Great Britain and France, with ample supplies of crude material and highly developed industrial power, are in the same condition as the United States.

In 1913 the total consumption of artificial dyestuffs in the world had attained a value of over $92,000,000. Germany furnished 74 per cent. of the entire amount and over one-half of the materials needed to make the remainder. The only country, in addition to Germany, manufacturing dyestuffs in any noteworthy manner for the world's markets in Switzerland. That country relies, however, for its crude and half-manufactured materials chiefly upon German sources. The dominance of Germany in the dyestuff production and commerce of the entire world is so marked, and inherently of such potential might, that it does not hesitate to make itself felt whenever and wherever an effort is made toward emancipation from its control. The methods used are those often associated with the working of great industrial corporations in various lands and now effectively checked by legal enactment in the United States. In the case of the German coal-tar chemical industry, the field is international and its operations are unchecked by law. Its influence has been felt at once in our own country when efforts to manufacture intermediate compounds or finished dyes threatened in any way the interests of the German production and trade.

ADVANTAGES POSSESSED BY GERMAN MANUFACTURERS, ACCORDING TO A REPORT OF THE DEPARTMENT OF COMMERCE

The coal-tar chemical industry includes not only the manufacture of dyestuffs, but of a number of valuable medical preparations, and of various high explosives. It is based upon the use of crude compounds present to a small extent in the tar obtained in the destructive distillation of coal in gas works and coke ovens. These ten crude compounds—benzol, carbolic acid, anthracene, etc.—are separated from some 145 other substances present in tar, by fractional distillation. This is the work of the tar distiller. From the ten crudes, nearly 300 more complex compounds, none of them dyes, are produced by highly refined and complicated chemical and mechanical processes, involving in most cases a number of complete chemical transformations. These serve as the materials for the manufacture of about 920 dyestuffs now in current use.

In the case of Germany, the domestic supply of "crudes" is amply sufficient. The color factories make all of the 300 intermediates required for Germany's own industry, and a large share of those used in the very restricted production of other lands.

The industry has been chiefly developed by the inventive power of German chemists, combined with a wealth of technical skill and keen business management, scarcely equaled in the history of any other branch of manufacture. The twenty-one

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If your motors are equipped with S.K.F. Ball Bearings, you are assured of having motors thoroughly proof against abuse, free from wear, and requiring lubrication but three or four times a year.

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Looms
and
Hangers

German companies engaged in the chemical dyestuffs manufacture have a nominal capital of over $550,000,000 on which dividends average 22 per cent. Actual profits often reach 50 per cent. The great excesses have been devoted to new construction It is the most remunerative industry in the Empire, the one most solidly and formidably intrenched, the one of which the nation is most proud as showing the triumph of science applied to industrial purposes, and the one illustrating most strikingly the ability to win and maintain international supremacy in a given field.

It took the Germans fifty years to get to this point, and it will take us at least one to two decades with an exhorbitant tariff to get to the point, but the beginning must be made to get to that point, and now is the time, and it must be made now. The psychological moment is upon us, and a condition, not a theory, has arisen, which must be met square.

It is estimated that at least 3,000 tons a month of various colors have been received monthly from Germany since the war started, and that has, in a measure, kept the mills supplied with the dyestuffs. If our mills were busy and were running full, this quantity of dyestuffs would hardly amount to two-thirds of the required amount to keep the mills running.

These are the figures that were transmitted to Mr. Tumulty, the Secretary of the President, by Herman A. Metz of New York, and from a very close observation the figures are about correct. There is an abundance of American raw material, and in one more month we shall have in this country more of the crude elements for the manufacture of dyes than Germany commands at the present day, though that country has for fifty years, as stated before, strived to systematize and increase its output annually.

In the United States the supply of coal tar is ample, sufficient to provide in abundance all of the crudes required for the manufacture of the dyestuffs consumed in the country. The amount of valuable by-products not yet recovered in our present coking plants amounts to $75,000,000 annually. With adequate provision to save all the benzol and tar liberated in American coke ovens, enough of the ten crudes could be secured to more than cover the world's consumption in making artificial dyestuffs.

One of the managers of the largest chemical works in this country, stated to the writer and a large group of Trade Journal editors and reporters, that the question of supplying sufficient quantity of intermediates in this country is one simply of demand and supply.

If a commercial demand is present, American tar works can quickly provide all the crudes needed, practically as cheaply as in Europe.

He further stated that in three months from now every steel company in this country, and every coke company in this country will be producing intermediates. In the manufacture of intermediates the production is restricted to four or five compounds, and these cover about one-quarter of the needs of American colors works.

Our manufacture of heavy chemicals is well developed, able to expand rapidly, and supply all needed chemicals for the production of intermediates and their transformation into finished dyes.

The four establishments devoted to the production of dyes supply nearly 100 different colors, largely, however, as already stated, by "assembling" nearly finished products of foreign origin. These American firms are bold and enterprising, commanding about $3,000,000 capital, evidently doing the best they can under existing conditions to build up a national industry.

Investigation shows that their advance, beyond certain limits, in the manufacture of either intermediate or finished dyes is persistently checked and prevented by the united action of German producers in underselling. The entire German color industry is so completely organized and accustomed to act as a unit in furthering the general interests, at home and abroad, that little success in facing their determined opposition has heretofore been obtained.

The present crisis has evoked deep interest on the part of all concerned, tar distillers, manufacturers of chemicals, manufacturers of dyestuffs, the many users of the same, and American economists in general—as to how the problem can be settled. There is no question but that our coke interests are ready to multiply their recovery plants for the production of benzol and tar, if a permanent market is assured. There is no question of the readiness of tar distillers to enlarge their plants for the production of an ample supply of the needed crudes if a continued demand is certain. American chemical works and American manufacturers of dyestuffs are ready to embark capital and experience in building up a distinctly American coal-tar chemical industry using entirely American crudes and intermediates, provided there is adequate legislative prohibition aganst both "dumping" or unfair restraint of American trade by the arbitrary action of foreign monopoly permitted by foreign law and not as yet forbidden by our own. Domestic makers assert their ability in the United States, which are now patent-free, and state that the remaining tenth will soon be freed from patent restriction.

WHAT THE AMERICAN INDUSTRY REQUIRES

There seems to be consensus of opinion that any rapid development and evolution of the dyestuff branch, on a scale commensurate with the nation's needs, present and prospective, can be assured only on the basis of an effective law preventing that action toward control of our markets by a foreign monopoly which is now prohibited to a domestic monopoly. Some of the largest manufacturers have personally informed the department of commerce that what is needed is not a tariff change, but laws placing a foreign monopoly on the same basis as an American one.

American economists feel that the present crisis offers the most favorable moment to decide upon a policy with regard to this one important industry, whether it is to be firmly rooted in American soil or whether the independence upon a foreign source is to continue indefinitely. It is

Tire Fabric Manufacture

requires the greatest attention to detail of construction and general "Condition" in the different processes of its structure. For the ***Standardizing*** of such goods, a ***proper Atmospheric Condition*** is a necessary accessory.

The choice of a Humidifying System must be one that for simplicity with great capacity and economy in maintenance produces uniformly such conditions that may be determined for the different requirements of the work. In the ***American Moistening Company's*** method of humidifying, all such requirements are guaranteed, this system having been adopted by the following manufacturers of Tire Fabric:—

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Worcester Tire Fabric Co., Worcester, Mass.
Bibb Manufacturing Co., Columbus, Ga
Danielson Cotton Company, Danielson, Conn.
Canadian-Conn. Cotton Mills, Ltd., Sherbrooke, P. Q.
Killingly Mfg. Co., Killingly, Conn.
Jenckes Spinning Co., Pawtucket, R. I.
Brighton Mills, Passaic, N. J.

In addition to the above, the following is a partial list of orders received during the ***Last Six Months:—***

Woodruff Cotton Mills
Kinston Cotton Mills
U. S. Worsted Co.
Champlain Silk Mills
Jackson Fibre Co.
S. Slater & Sons, Inc.
Pepperell Mfg. Co.
Bettie-Francis Cotton Mill
Grosvenor-Dale Company
Stafford Mills
Gainesville Cotton Mills
Dana Warp Mills
Klots Throwing Co.
Floyd Cranska Co.
W. A. Slater Mills
Bates Mfg. Co.
Schwarzenbach Huber Co.
Midway Mills
W. H. Grundy & Co.
Trion Company
Utica St. & Mohawk Val. Cot. Co.
Victory Mfg. Co.
Great Falls Mfg. Co.
Dominion Textile Co., Ltd.
Gibson Mfg. Co.
Abbeville Cotton Mills
Hillside Cotton Mills
Knoxville Spinning Co.
Colored Worsted Mills
James Lees & Sons
Centredale Worsted Mills
Am. Silk Spinning Co.
Queen City Cotton Co.
Cheney Bros.
Nonquitt Spinning Co.
Hamburger Cotton Mills
Warwick Mills

Of the above equipments, in whole or in part, some are our Standard Atomizing or Compressed Air System; others are our regular Sectional type of Humidifier, inclusive of Automatic Control; Conditioning Room equipments, etc.

American Moistening Company

WILLLIAM FIRTH, Prest. **FRANK B. COMINS, Vice-Pres. and Treas.**
120 Franklin Street, Boston, Mass.

JOHN HILL, Southern Representative, 1014 Healey Bldg., Atlanta, Ga.

pointed out that each year elapsing increases in geometrical ratio the difficulties attendant upon any attempt to create a self-contained American dyestuff industry. Further, it is claimed that it is the only highly organized industry not yet brought on a broad and generous scale within the cycle of American economic activity.

As one of the solutions of this problem of dye shortage, we read in "Commerce Reports," No. 166, of Saturday, July 17, 1915, an advice that the Swiss chemists can meet American needs, and that by a system of practical cooperation, namely; this country to furnish all of the crudes and intermediates, and the Swiss chemists in their great chemical works, converting the same into finished dyes and shipping these to this country.

Gentlemen, that was advice dated July 17, 1915, and while that was a very good advice on that day and date, which was previous to the entry of Italy in actual warfare, when her ports were open to receive and ship Swiss dyes to the United States, that advice is not good today—September 11, 1915. It must be remembered that Switzerland up to the present time, has obtained the raw materials for its dyestuffs from Germany, and that is at the end. Germany can neither supply the crude materials for dye making to Switzerland, because she herself is employing every available pound of these for the purposes of warfare for the manufacture of explosives, etc. The hostilities surround this inland neutral government on all sides, so that Switzerland is neither able to receive the raw material nor to export the dyes. That ends the Swiss chapter of this narrative.

In England and France the textile and other branches have insisted that the national industries must be permanently freed from independence upon a foreign source for one of the vital needs of the most varied manufacturers. Within a fortnight the group of French chemists intrusted with the problem claim that they have satisfactorily solved all difficulties in the way. During the same period the necessary steps have been taken in England, where the Government has provided for the organization of a national company to create an independent dyestuff industry, contributing nearly $2,000,000 to its capital, and granting at the same time $500,000 for the requisite research laboratory.

It is then up to us here on the American soil to do the best we can under the existing conditions, and looking the issue straight in the face, as stated before, this is a condition and not a theory. First, the war will not be over for a year and possibly not for three more years, thus the leading cabinets of European powers predict. Germany, England nor France at the present time have any intermediates which they could spare, for the manufacture of dyes, and when the war will be over you will find a decade of periodical upheavals, industrial and business stagnation due to three facts. First, the lack of material to begin operations with. Second, the lack of sufficient industrial talent to continue operations, since the best blood of Europe is today sacrificed on the altar of bloodlust; and third, financial bankruptcy, which any one must see as the handwriting on the wall shows it, and as it requires materials, skill and money to run industries, all these being in the negative quantity, the American industries must develop and must fill the want which is now felt.

We have been informed, through a very reliable source, that the shortage of dyes will possibly effect as many as 2,000 plants, representing the various industries throughout the United States, and it is assumed that probably two million operatives will be affected directly, without considering those occupations or trades dependent upon these industries.

In the "Commerce Reports" issued by the Department of Commerce, the following analysis of the dyestuff problem is given:

1. The raw materials of the artificial dyestuff industry are present in the United States in greater abundance than in any other land, and are for the most part wasted.

2. The American market for the products is one of the largest, if not the largest, in the world.

3. The supply of chemicals required to transform the constituents of coal tar into finished dyestuffs can be furnished easily by American chemical works. A modest but encouraging beginning has been made in the production of American dyes. Capital is ready to embark in the undertaking in ample amount.

4. The government is determined to protect such an industry against the dangers of unfair competition on the part of foreign rivals.

5. Technical and scientific skill, inventive talent, and administrative and commercial ability are present in abundance.

6. The one factor lacking to bring into existence a genuine American coal-tar dyestuff industry is the cooperation of a few men possessing highly developed capacity for organization, combined with a perfect experimental command of the exceedingly complex and intricate field of color chemistry in all its ramifications—men such as created in the past the great works on and near the Rhine, and are now directing them.

If this analysis be correct, and in our humble opinion it is closely touching the crux of the situation, then waiting for what tomorrow will not and cannot bring, is the one thing which American manufacturers and American capitalists cannot afford to do. Get together and dig now, is the slogan.

—÷—

THE PURCHASING AND STORING OF MATERIALS AND SUPPLIES FOR COTTON MILLS

H. B. Twyford, Eleventh Ave. and Twenty-sixth St., New York, N. Y.

In a short paper of this character it is impossible to do full justice to this interesting subject, and it is extremely difficult to condense and curtail those points which it seems essential to mention, and equally difficult to decide what to eliminate.

It is proposed to omit any reference to such things as the psychological questions involved, also questions of finesse and strategy between buyer and seller, ethics of buying, and many other points which could be elaborated on. A proper

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UNDER THE MANAGEMENT OF

J. E. CONANT & CO., (Auctioneers)

OF LOWELL, MASSACHUSETTS

Means:—

"That the property will be SOLD"

THAT a property will be systematically prepared for market; that its sale will be given broad publicity; that all its possibilities will be searched out and made known; that it will be presented to prospective purchasers in an honest, straightforward and truthful manner by word, by picture, by plan, to the fullest detail—nothing will be left untold for the possible purchaser to discover and resent in his disappointment; the problem in hand will be justly solved in fairness alike to the seller and the buyer. Combinations not endured. Experience gained in the one office in the handling of manufacturing properties at public sale in every New England State; in all the Middle States excepting the State of West Virginia; in Ohio, Indiana, Kentucky and Missouri of the Central States; in North Carolina, Tennessee, Alabama and Mississippi of the Southern States—is not common to say the least. The management of the sale of some three hundred manufacturing properties—textile and industrial—large and small—has come to this office unsolicited in this century alone—realizing more than 8½ millions of dollars. In not a single instance, so far as is known, has the net result of any one of these sales been so small as the best offer at private treaty for the same property under similar conditions. A market is absolutely essential to the disposal of any property. At a bona fide public sale a market is created and a market day fixed—if the work is properly done. To pledge a manufacturing property without limit or reserve to the highest bona fide bidders at absolute auction sale attracts the manufacturer, the purchaser who buys for occupancy, the consumer or final user so to speak—but to offer the same without pledge to the highest bona fide bidders attracts only the second-hand dealer, the speculator, those who buy at a great sacrifice to hold for a profit, or the bargain hunter.

The business of the systematic preparation of properties for absolute auction sale and the thorough and effective advertisement of such sales has become of as much importance in the successful liquidation of large manufacturing properties as has the clearing house system to the national banks.

Entire Transaction—From Start to Finish—Taken in Charge

realization of the importance of the function of buying and the closely related function of storing materials and supplies is not prevalent among the manufacturers of this country. In an abbreviated form this will be emphasized and some samples given of methods employed in keeping useful and intelligent records.

AS A VITAL FACTOR IN ANY BUSINESS

Purchasing is one of the primary functions in the activities of the great complex structure called

H. B. TWYFORD

business. The acquisition of raw material is the initial step incurred in the cost of manufacturing anything. In merchandising, a purchase must be made before a sale can be effected. In construction work, tools and equipment must be procured before workmen can commence operations. The significance of this subject is brought forcibly to the attention when it is realized that every undertaking or enterprise in its inception involves the necessity of buying something, and the continuance of its activities perpetuates this important function.

It is easily conceivable that promiscuous buying would be a serious handicap to the success of any concern. It would render complete success unattainable, and the very existence of an establishment might be endangered and jeopardized. For the efforts of any organization to culminate in the most desirable fruition, it is a predominant constituent principle that its expenditures be properly regulated and wisely and judiciously made.

INFLUENCE OF BUYING ON PROFITS

The profit on any manufactured article is not determined by the price as much as it is by the cost. The selling price is fixed by the demands of the public and competition. The first effort usually made to widen the difference between cost and price is to increase the output by encouraging the demand through advertising and more scientific salesmanship. When the limit is reached in this direction, recourse is had to investigating reduction of costs, and the principal attack is made on the labor item. In the days of primitive manufacturing, labor and material were the only two items considered in computing costs; but today labor may rank third in the five main stages by which an article reaches its selling price. Roughly, these are material, labor, indirect expense, selling expense, and profit. If a diagram is made showing these, it would represent successive but unequal steps from zero to 100, and the two highest steps would probably be material and indirect expense. Efficient methods of reducing these should go hand in hand with the efforts directed at labor costs. To reduce the cost of materials an effective system of buying is compulsory, coupled with proper storing and handling.

Regulated and right buying is a study in economics, and the great importance of good buying is emphasized by the fact that a large percentage of the profits of any concern is absolutely and undoubtedly due to the ability to buy the best from a utilitarian point of view for the lowest price. This is the first step in the profits.

THE PHILOSOPHY OF BUYING

The philosophy of buying can be succinctly summarized in one sentence. It means paying the right price for the right materials in correct quantities for delivery at the proper time.

Too often the question of price is made the determining factor in making a purchase without due consideration being given to the other phases of the transaction. Price and quality must be considered together. One sometimes bears an inverse relation to the other, and for one's special and particular requirements the highest quality may be the cheapest; but conversely, a material which graded higher than the specification might not be equally serviceable for the purpose and prove the most expensive. In buying for production work, therefore, the prime essential is to purchase at the lowest possible price the material that complies strictly with the specification which has been drawn, based on the exact knowledge of the action of the material during the manufacturing process and in the finished product.

Buying at inopportune times or in excess of requirements is liable to entail severe losses unless

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WHEN we say Hotels Statler offer a "complete service" we mean that every guest gets what he *wants* in a Hotel Statler. He is served by well-trained, unobtrusive employees who are in the background till the moment they're wanted, and are there right at hand *and interested*. He gets this service whether he spends $1.50 or $10 a day.

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Hotel Statler lobbies and public rooms are cheerful, luxurious and comfortable.

BUFFALO
450 Rooms
450 Baths

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IT'S THE LAST reserve strength of Laminar Fibre that makes Laminar Roving Cans more economical. It has a toughness and a lasting quality that ordinary fibre does not have. Add to this, electrically welded, tinned steel rims, heavy kicking bands, etc., and you have logical reasons for making Laminar Fibre Cans your next choice.

Made in all sizes, standard or special. Catalog on request.

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American Vulcanized Fibre Co.
C. C. BELL, V. P., 12 Pearl Street
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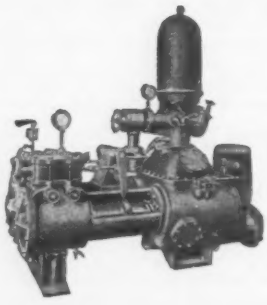

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is a splendid thing, but

Fire Protection is Better

The first will recoup your property loss, but a Blake-Knowles Underwriter Fire Pump will prevent the loss, not only of your property, but the business you cannot do while recovering from a fire. Be protected.

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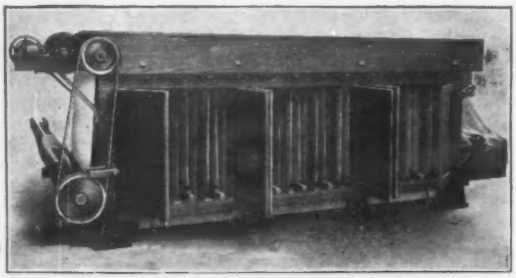
The Blake & Knowles STEAM PUMP Works

Works: East Cambridge, Mass. New York Office: 115 Broadway
Branch Offices in all Principal Cities B240.2

Manufacturers Cooling AND Conditioning Machine



No finishing room should be without this machine. Indispensable for cooling cloth so as to permit of immediate inspection.

Finished cloth restored quickly to its **Natural Condition**

Manufacturers Machine Co.

Lawrence, Mass.

Selling Agents: EDWARD JEFFERSON & BRO.,
122 So. Second St., Philadelphia, Pa.

there are compensating advantages in the matter of price. An accumulation of goods beyond what is required to keep the business moving along its appointed way means that the following losses are incurred: Depreciation, insurance, value of space occupied, and obsolescense of money invested.

THE ART OF BUYING

The steady advance in the art of buying has been one of the determining factors in developing scientific salesmanship. It is no longer possible for a salesman to walk into a modern purchasing office and carry away an order on the strrength of a few persuasive arguments and statements regarding his goods.

Today the buyer sometimes knows more about the material than the salesman. He should certainly be better posted as to its suitability for his particular requirements. He has his inspection reports, laboratory analyses and physical tests to guide him. He has records regarding past performances of material, quantities consumed and probable future needs, also estimates as to the available supply in the market.

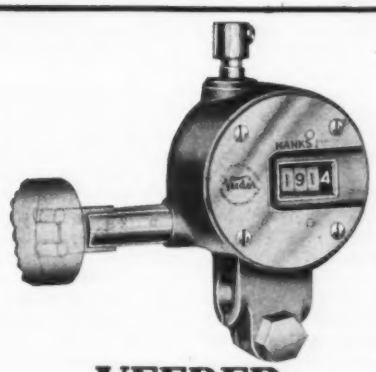
This information can be collected, tabulated, formulated and reduced to exact knowledge. Armed with this equipment the purchasing power is at its maximum, while the salesmanship required is at its minimum. Under these conditions the advantage is with the buyer, and the best results in the matter of price, quality, terms and delivery are obtainable.

To put this into practical effect, therefore, it is necessary to apply systematically the knowledge which the purchaser must possess, and direct it with wisdom and intelligence in all the activities connected with buying.

For a buyer to exercise his art to the greatest perfection, it is necessary to have certain data and information available for easy reference. Starting with his sources of supply, if this has been kept up in good shape, he knows that the people he has asked for quotations are the very best in the country to furnish him with what he wants. He knows they are in the best position to quote him favorable prices and give him best service. He has arrived at this conclusion by a process of selection and elimination. He knows his specification has been correctly and accurately drawn. He knows from his records of past purchases and future requirements the exact quantities he must have and the dates on which he must have delivery. He can, therefore, confidently proceed with the final negotiations with the assured feeling of closing a successful transaction.

THE PURCHASING DEPARTMENT

The purchasing of materials and supplies was originally segregated because the undivided attention of one or more persons was necessary to accomplish this important function. The organization of establishments into departmental formation naturally demanded that this function should be recognized. Thus was created the purchasing department, and it now has a fixed and permanent position in commercial life. The essentiality of its existence has been proved by the great benefits derived from the systematizing of purchases, by the economics it has been able to effect, and by



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Textile Counters

are the most convenient and accurate devices made to give the textile manufacturer a record of machines and operators.

The hank counter shown above (1-2 size) is designed for roving, drawing, ring frames, mules, etc. The great advantage of this counter over counters having a dial and hands like a clock is that it can be easily read by anyone, even though not familiar with counters, and consequently mistakes and disputes are avoided. **Price, $7.00.**

There are Veeder Counters for almost every conceivable purpose. We would like to send you a descriptive booklet free.

Cyclometers for Bicycles and Motorcycles. Odometers for Automobiles and Horse Drawn Vehicles. Counters for practically every purpose. Tachometers, Tachodometers and Fine Die Castings.

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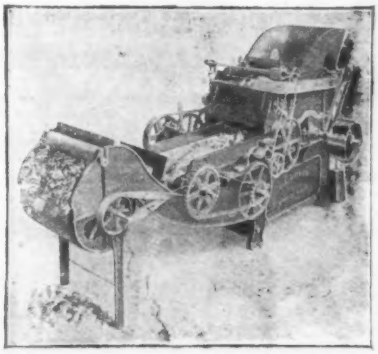
The Latest "Dodge"



Rag or Shoddy Picker
With Improved Non-Clogging Condenser

MAKES fire-proof gauze room unnecessary, saves space, and reduces fire hazard. Picked stock always in sight, and easily removed. Equally efficient on fine or coarse work. Equipped with Imported Ball Bearings. "Bit" Attachment insures better and more uniform product. Send for details.

C. S. DODGE, LOWELL, MASS.

Pickers, Bagging Machines and Picker Pins. Cylinder Coverings a Specialty.

"IF DODGE DOES IT—IT SATISFIES"

the fact that it has enabled the other departments to devote their whole time to their special work. These advantages will be more fully demonstrated by its growth in efficiency.

The policy of centralizing the buying should at the same time constitute the department as the court of last resort in arranging prices, terms, deliveries and all the final negotiations leading up to the actual placing of an order. If salesmen are allowed to solicit business from the heads of other departments, coming to the purchasing department for a confirming order, it reduces its usefulness and standing. Sellers should not be allowed to go over the head of the purchasing agent, for he is then a known element of power and any other policy would weaken his position in negotiating a deal.

The attitude of the other departments of an undertaking will be a reflection of the purchasing department's service to them, and the criterion by which it will be gauged. The demands on it grow naturally from the needs of the business, and cannot therefore originate with the department itself. For this reason it is essential that the work be efficiently and expeditiously carried through, for on this depends the measure of usefulness it is to other departments and to the whole undertaking.

PURCHASING RECORDS

While the problems connected with purchasing materials and supplies are quite distinct from those connected with storing, nevertheless the two are closely related. In some establishments both may come under the control of the same person, but in others the organization may be on lines which keep their activities separate.

Taking the questions connected with purchasing first, one of the initial things necessary to know is where to buy. This means a comprehensive record should be kept of sources from which supplies can be obtained. Catalogues are useful but not sufficient. However, a good library of them should be kept properly filed and indexed. In doing this two sets of index cards should be used.

More important than the catalogue cards are the cards indicating sources from which anything used in the mill can be secured. One may be buying from a source which is apparently satisfactory regarding price, delivery and complete ability to furnish the full quantity when and as needed, but probably every manufacturer has at some time been faced with a situation in which it would have been exceedingly valuable for him to know promptly where his requirements could be satisfactorily met from sources other than those he has habitually drawn from. For this reason it is important that the card recording these facts should be kept alive and up to date.

The card can also be used for recording prices quoted by enlarging it and adding the necessary columns. It may be found, however, that it is better to keep the quotations on separate cards.

A record of prices paid for and quantity purchased of materials, if consistently kept for a number of years, is extremely useful, and from this a curve can be made up from which variations in prices can be seen at a glance. Many interesting and instructive comparisons can be drawn from

FACTORY PROTECTION FENCES
SEND FOR CATALOGUE "K"
OLD COLONY CHAIN LINK FENCE
OLD COLONY ANGLE IRON FENCE
OLD COLONY FOUNDRY & FENCE CO.
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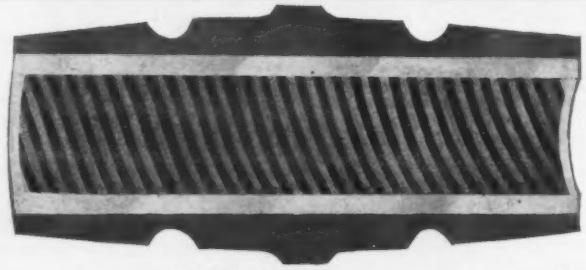
WE BUILD OLD COLONY FENCE ANYWHERE



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High or Low Speeds
TRADE MARK
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Graphite Impregnated Wood Oil-less Bushing for Light Work — High or Low Speeds

Heavy Work
Graphite and Bronze Bearings are the Last Word in a Practical Oil-less Bearing for Loose Pulley, Hanger Boxes, etc.

We are Specialists in Oil-less Bearings. All Genuine Graphited Oil-less Bearings have always been made at Bound Brook, N. J., in the United States of America

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No. 2 Church St. **GRAPHITE LUBRICATING CO.** Bound Brook, N. J.

such curves, such as, for instance, the relation between material and labor expenditures, also as between overhead charges, quantity and value of goods sold, and many other features which every manufacturer likes to have before him in the simplest, most readily understood, and at the same time, informative manner.

There are some other records which are essential to many offices. It may be necessary to tabulate all purchases, keeping a record of total value. There are important reasons for this which are fully explained in the author's book. A "Comparison of Quotations" card should also be kept. It is impossible to give samples of all these forms, and it is not intended to give samples of requisition and order forms, which are matters of individual requirements.

Another point which must be closely watched is the progress and final completion of shipments made on orders. If an order has been placed under the most favorable conditions as to price, terms, etc., nevertheless the whole economic value of the satisfactory purchase might be lost if the goods were not delivered on time, or excess quantities were delivered; and in addition to this severe losses might be be incurred from suspension of work in the mill with the contingent liability connected with a failure to complete a contract on time. There are several methods which may be adopted by any manufacturer for strictly controlling these features, and it cannot be too strongly emphasized that any purchasing system, however limited in its activities, is woefully incomplete without one.

INVOICES

Before giving examples of store records and methods of keeping track of materials and supplies on hand, the problem of dealing with invoices requires some consideration. On the efficient handling of these depends in a large measure the securing of the benefits which have accrued through the purchase of materials and supplies at satisfactory prices and deliveries. Improperly checked or delayed invoices means losses in overpayment, duplicate payments and loss of cash discounts which might more than offset the gains made by shrewd and clever purchasing. To insure these invoices being passed through the purchasing department in an efficient manner, systematic methods are essential. These are fully explained in the author's book.

STORE RECORDS

From the initial movement made by any manufacturer for a contemplated purchase until the purchase is consummated, the supplies delivered and actually consumed in the manufacturing process, it is a problem in economics, and not the least important part of that problem is the question of keeping proper records of the supplies during the quiescent period when they are at rest in the stores or mill; that is the time subsequent to the purchase of them and prior to their actual consumption in the mill. It has been demonstrated many times that some manufacturers have only vague conceptions regarding the quantities and values of supplies on hand in the long

For More and Better Yarn Use
LAMBETH SPINNING TAPES

Our new line of Spinning Tapes will equal in quality the famous "Lambeth" Banding.

It will be uniform at all times; containing no mixed nor job lot yarns. It will stretch but little, yet will be elastic and will withstand wear on edges.

We can make these tapes from any yarn or cotton to match samples and will produce tapes equal or superior to the finest of the imported grades.

We have special tape designed for high speed in COTTON MILLS.

The best tape is none too good for you, yet you will find our prices reasonable.

Save the expense of frequent changes of tape and splice sewing—

"LAMBETH TAPES STAY PUT"

Send for Samples

LAMBETH ROPE CORPORATION - New Bedford, Mass.

DON'T REHANDLE YOUR ASHES

Geco Steam Jet Ash Conveyors

are Dustless, Simple, Reliable, and Safe— No Moving Parts

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GREEN ENGINEERING COMPANY

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Green Chain Grate Stokers **Geco Pneumatic Ash Handling Systems**

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Builders of Improved

Cloth Tentering and Drying Machinery

for WOOLENS, WORSTEDS, FELTS, Etc.

Built Upright or Horizontal with Low Down Feed

Ventilating Fans a Specialty

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We Make and Repair

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For Every Known

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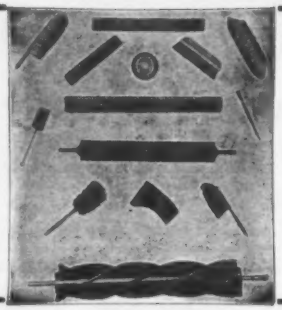
The Name MASON Guarantees



Mason Brush Works

Worcester, Mass.

Agt. and Mgr.
CHAS. A. O'NEIL

Why Not

install individual electric motor drive, an essential to profitable Textile manufacturing? WE HAVE THE MOTOR FOR THE WORK.

Write us for data

CROCKER-WHEELER CO.

MANUFACTURERS OF MOTORS, GENERATORS and TRANSFORMERS

Ampere, N. J.

intervals between the dates at which they take a complete inventory.

There is nothing inherently complicated in keeping intelligent and accurate records of supplies, even when it is not possible to assign a building or storeroom for the particular purpose of safeguarding them and controlling the giving of them out for use in the mill. This is a question of the inauguration of an efficient system and regularly and consistently following the routine work connected with it.

The principal points necessary to consider are:

1. The receipt of supplies with proper checks, examination, inspection and an accurate record of quantities, sizes and values.

2. Placing these supplies in storerooms, or such designated places or receptacles that they are safe from waste, deterioration or pilfering until given out to the mill for working up into the finished product, or for maintenance of the plant.

3. Furnishing to the mill the necessary supplies in such quantities and at such times as they are required to keep it in active operation, and only when authorized by specified persons, (foremen, superintendents, or others), who have been empowered to do this.

4. Maintaining a record or perpetual inventory of the incomings and outgoings. This is a form of bookkeeping simple in the extreme, but to be of value must be diligently and accurately kept.

The methods to be followed are best illustrated by the forms which are given here. It must be borne in mind that these are suggestions only, but might be adapted "in toto" by some mills. It will doubtless be found, however, that in many cases there are special circumstances which demand special features. These can be readily furnished by the trained mind. The explanation given with each of the following forms should make them easily understood.

As explained in the first paragraph of this paper, the information given here is necessarily brief. The full details connected with the matters mentioned in this paper form a special study and can only be gained by experience and research. It has not been possible to go into the question of arriving at a decision as to the quantities to buy and the best time to buy. To weigh the considerations thoughtfully and carefully which finally determine these questions is a special study in almost every individual case, and requires the knowledge of the specialist.

For further information and fuller explanation of methods employed with various forms and charts, any interested person is referred to the author's book on Purchasing, published by D. Van Nostrand Company, 25 Park Pl., New York.

(Included in this paper are a number of interesting diagrams which can be obtained on application to the Assocation..

Pennsylvania, Philadelphia. Contracts have recently been awarded for alterations and additions to be made to the plant of the Summerdale Dyeing, Printing & Finishing Works, dyers, printers and finishers of cotton piece goods, located in Holmesburg, a suburb of this city.

The Memphis Terminal Corporation

Makes a big showing for the fiscal year just ended

The largest cotton terminal and storage warehouse plant in the world located at Memphis, Tenn., the world's largest inland cotton market.

The first mortgage six per cent. bonds secured by this plant make a high grade investment whose safety must be appreciated by Textile men.

Write us for a descriptive circular M and picture of the plant.

MARSHALL & COMPANY, Inc.

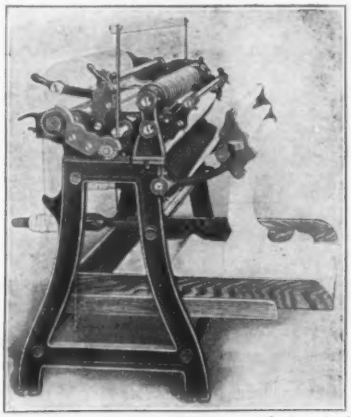
Bankers

Seventy State St., - Boston, Mass.

The Ireland Cloth Cutting Folding and Winding Machine

Cuts Cotton or Woolen Fabrics, Knit Goods, etc. for Bindings, Facings, Fronts, Button Stays, etc.

Straight or Bias



This machine saves 6% to 15% in cloth; 25% to 50% in labor over the old methods.

Ask us for particulars

The Ireland Machine & Foundry Co.

Norwich, N. Y.

THE

"No-Waste"

Seamless Hard Fibre Roving Can

It does not have the riveted seam that strains and breaks the sliver

NO SEAMS OR RIVETS

ABSOLUTELY SMOOTH

Also

Fibre and Steel Clad Cars
Doffing Trucks
and
Mill Boxes All Kinds

Sheet Fibre Tubes
Rods
Special Shapes

Standard Fibre Co.

25 Miller Street, Somerville, Mass.

The factory or industrial plant requires a dignified fence that will stand up erect against all comers. Strength and beauty combined with simplicity are strong features of

Excelsior Iron Fence

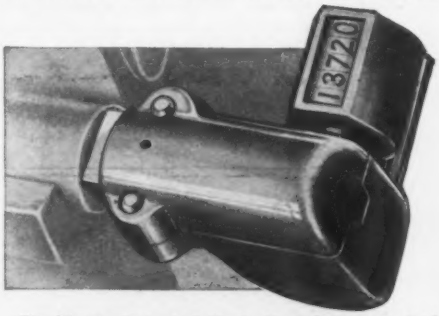
When properly erected, with posts set in concrete, your fence does not sag or get out of alignment or become "tumble-down." Made in numerous styles. Special designs, including some of the more ornamental patterns, furnished when desired.

Appropriate for Factories, Parks, Playgrounds, Large Estates, all Public Enclosures

We also make Excelsior Rust Proof and Chain Link Fences in many styles. Ask your hardware dealer and write us direct for Catalog L.

WRIGHT WIRE CO., Worcester, Mass.

A Better Hank Clock at a Lower Price



The Morton Patented Hank Clock being attached to the roll is not effected by wear of either the roll necks or stands.

Registers 10,000 hanks, giving weekly, monthly or yearly readings at a glance. Made right and left hand for 1" to 3" rolls, for Drawing, Combing, Roving, Spinning and Twisting.

Price $3.00. Discount for quantities.

Here's what the Carder Wants—
Our Patented Card Flat Drive that will end his card flat troubles at less than ⅓ the cost of new chains. Free sample on request.

MORTON & ANDREWS
497 Worthen St., - Lowell, Mass.

REVOLVATOR

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For the

Rapid
Cheap
Safe

piling and unpiling of baled cotton, cotton cloth, waste or cased goods the Revolvator is the most efficient tool.

This picture shows how easily one man can hoist a 500-lb. bale of cotton. How do you pile?

Send for Illustrated Bulletin W-31
"The Revolvator in the Textile Industry"

N. Y. Revolving Portable Elevator Co.
349 Garfield Avenue, Jersey City, N. J.

*Connecticut, Mystic. A charter has been granted the Mystic Lace Mill with capital stock of $125,000 to manufacture lace and other textile fabrics. The incorporators are William D. and George G. Sowter, and Charles H. Foley, of Mystic. This company will bring machinery from England and will manufacture lace in the building known as the Royal Linen Mill. Part of the old machinery in the Royal Mill has been purchased by Fyans, Fraser & Blackway Company, of Fall River, for re-sale.

Massachusetts, Boston. An increase has been made in the capital stock of the Cynthia Mills, 16 New St., E. Boston, from $50,000 to $100,000, for the purpose of taking care of the increased business. This plant operates winding machinery and reels for putting up embroidery yarns, which are sold through Harding, Tilton & Company, Boston. Nathaniel F. Ayer, 70 Kilby St., Boston, is treasurer, and E. D. Robinson, superintendent.

Massachusetts, East Dedham. The old Merchants Dye Works, at the corner of High and Maverick Sts., are being rebuilt by a new concern known as the Dedham Finishing Company, which will equip the plant for bleaching and finishing fine piece goods. A charter has been secured with capital stock of $110,000. William H. Gray of the Eastern Chemical Company of Boston is president and treasurer; Irving W. Bedell is agent and buyer. Steam, water and electric power will be used.

Massachusetts, North Adams. Considerable electric power equipment has been installed in the Arnold Print Works in the last few months.

Massachusetts, North Dighton. The Mt. Hope Finishing Company is building an addition. Warren B. Lewis, a consulting engineer of Providence, is in charge of the work.

Massachusetts, Shirley. A new water wheel has been installed by the Samson Cordage Works and the old wooden flume is being replaced with one of concrete 60 feet in length and 12 feet wide. The plant is shut down this week to give the employes a vacation.

New Jersey, New Brunswick. A cotton nitrating plant is being operated at Metuchen, under the name of the Nixon Nitration Works, giving employment to about seven hundred hands. Lewis Nixon is proprietor and Stanhope Nixon is buyer. Electric power is used.

New Jersey, Passaic. An addition of considerable size is being built to the plant of Jacques Wolf & Company, dealers in dyestuffs and chemicals.

*Pennsylvania, Kutztown. A concern known as Fincus, Harrel & DeLong has been organized and will establish a twenty-loom rug plant here in the building of the Reider-Fisher Shoe Company. The men interested are Calvin C. Fiscus, formerly connected with the Long Valley Rug Mills, at Mertztown, William Harrel, and David W. DeLong, a Mertztown business man. The charter authorizes the concern to manufacture and deal in carpets, rugs, knitted and woven goods, etc.

Belting Service
MOISTURE PROOF, dust proof, acid proof—all but wear proof—do you know Gandy the Original Stitched Cotton Duck Belt?
The thousands and thousands of Gandy Stitched Cotton Duck Belts now in use are your best guarantee that it is worth knowing
It costs only about one-third the price of leather belting and much less than rubber belting. Yet 37 years of experience in all industries proves that it will do the work of either and EQUALLY AS WELL. Let us send you samples and full information.
The Gandy Belting Company
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GANDY'S
BELTING
GANDY

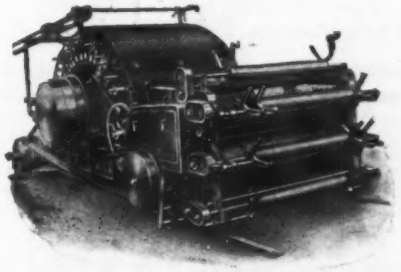
Cotton Waste Machinery

Complete equipment on

English and Continental Systems

TO

Prepare, Card and Spin all kinds of Cotton Waste



Single Finishing Carding Engine with Leather Tape Condenser, for Cotton Waste

Wm. Tatham, Ltd., Rochdale, England

Agent:

Wm. Firth, 200 Devonshire St., Boston

$84.50 BUYS

A 4x4 Hand Power ELEVATOR

We Build Hand and Power Elevators

in all sizes and capacities with all modern safety appliances

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Manufacturers of

Circular Rib Knitting Machinery

Automatic Stop-motions
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Special machinery of all descriptions

We Specialize

COMB CIRCLES

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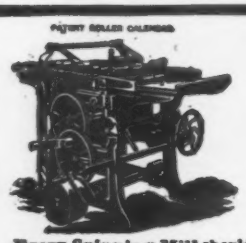
FALLERS

R. H. Hood Company

Established 1885

1842 Germantown Ave., PHILADELPHIA, PA.



DRONSFIELD'S Patent Automatic Roll Calender

Every Spinning Mill should possess this machine for periodically calendering leather covered rolls.
RESULTS: Better Spinning! Fewer Broken Ends! Economy in Roll Covering!

Supplied by any of the leading

Textile Machinery Importers, Boston, Mass.

*Alabama, Huntsville. The creditors of the Huntsville Cotton Mills, who recently bid in the plant, do not intend to start the mill but will try to sell it.

Connecticut, Bridgeport. The New England Web Company has been incorporated with capital stock of $25,000 to make elastic and non-elastic webbing. The incorporators are Jacob Silverstone, Samuel L. Silverstone and Louis Golden.

Connecticut, Chester. John T. Hettrick, 165 Broadway, New York City, E. Mora Davison, J. J. Coakley, F. A. Palen, and others, have incorporated the Middlesex Chemical Company, Inc., with capital stock of $1,000,000. This corporation conducts the chemical manufacturing business which it was noted early in July had been established in Chester. Equipment to manufacture phenol and other chemicals has been installed by the J. P. Devine Co., of Buffalo, and J. P. Devine of this concern, is one of the directors. August Belmont & Co., New York, are said to be the fiscal agents.

Connecticut, Danielson. More machinery has been started up by the Danielson Cotton Company, manufacturers of plain and fancy cotton goods, as a result of large orders recently received which it is reported will insure the plant running to capacity indefinitely.

*Connecticut, New Haven. Work will not go forward this year on the proposed new industrial plant to be built at Riverside, the new industrial settlement on the water-front, according to R. G. Cory, 39 Cortland St., New York, the engineer in charge. There is a possibility that the owner may sell the site.

Connecticut, Shelton. The plant of Sidney Blumenthal & Company, Inc., is running 52 hours a week on a day shift, and 47 hours a week on a night shift. An increase in the hourly rate of wages has been made so that the employes will earn the same under the reduced schedule as formerly under the longer schedule. They announced several months ago that an increase of fifty per cent. would be made in the production by overtime operations.

Connecticut, South Manchester. Cheney Bros. will discontinue the Bigelow Mill as a weaving plant and will consolidate this department with the mill on Pine St.

Georgia, Atlanta. A concern known as the Pynetree Mfg. Company, engaged in the lumber business, may establish a small rope and bag mill, and is interested in information on equipment.

Indiana, Sullivan. A local report states that the court has granted permission to sell the plant of the Sullivan Woolen Mills. A sale for the property has already been arranged, it is said.

Maine, Sangerville. It is reported L. J. Coburn, treasurer of the new Glencoe Woolen Company, who is trying to interest capital in starting up the Sangerville Woolen Mills, headed the company which developed Industrial Place in Danielson, Conn.

Massachusetts, Barrowsville. An addition, 75 by 150 feet is being built at the plant of the Barrowsville Bleachery. It was noted recently that there were indications that the Barrowsville Bleachery will be reorganized and the plant started up.

Massachusetts, Boston. Bowes, Blackstone & Company, woolen and worsted yarns, have opened a New England office at 161 Summer St. with Theo. J. Bowes in charge. The main office is at 242 Chestnut St., Philadelphia. They represent several large spinners of French and Bradford spun worsted yarns, also manufacturers of woolen yarns of every description.

Massachusetts, Chicopee Falls. The Lamb Knitting Machine Company has begun the erection of a new building to cost $10,000 to be of brick and steel and to be erected on land occupied by the old wooden buildings which have been torn down.

Massachusetts, Clinton. The Burton Company, which purchased the Victor Mill and is operating it on woolen and union yarns and cloth, after making a number of changes and installing new machinery, has a number of orders and may have to increase the number of employes or operate overtime.

*Massachusetts, Clinton. James Tattersall, proprietor of the Sterling Mills, small manufacturers of Turkish towels, which recently moved from Philadelphia to the top floor of the Brodfelt Mill, Clinton, is quoted as stating that he intends to purchase more machinery. About a dozen hands are employed.

Massachusetts, Lowell. The Merrimack Woolen Company at Dracut, is reported to have received a large blanket order which is said to be of substantial size and has been contracted for by the Italian Government.

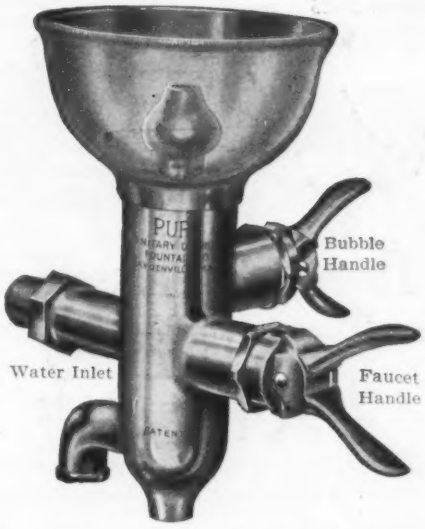
Massachusetts, Medway. New machinery is being installed in some departments by the Fabyan Woolen Company, manufacturers of cotton warp flannels, shirtings, dress goods and carriage cloths.

Massachusetts, New Bedford. Morgan Butler, treasurer of the Butler Mill, denies the report that plans are being made for an addition to the plant to be built on the south end of the present weave shed.

Massachusets, Newton Upper Falls. The Newton Mills, manufacturers of spun silk yarns, are on full time and have plenty of orders on hand to keep the plant busy for several months.

Massachusetts, North Adams. It is reported the North Adams Mfg. Company has received an order for 50,000 yards of woolen khaki cloth for export to Europe and that work is to be started on the order at once.

Massachusetts, Palmer. Following the same plan as last year the Thorndike Company of Thorndike, the Palmer Mill of the Otis Company of Three Rivers, and the mills at Bondsville, the products of which are sold by Bliss, Fabyan & Company, shut down August 20 until after Labor Day.



Saving or Wasting?

The manner in which you handle the drinking water problem in your plant may seem to be a small matter to you —but investigate. The results will be surprising.

The old time faucet is costly. Running hour after hour, day after day, its ceaseless flow is costing you money yet without any better service.

Puro Saves 35%

A Puro Sanitary Drinking Fountain will cut that water bill 35%. We can prove that it has done that for others.

It will give every employee a safer, saner draught of bubbling water free from the contamination of the common drinking cup.

In a word, it is the only sanitary Drinking Fountain that is really safe, sanitary, simple, automatic in control and easy to attach.

"PURO-FY"

YOUR WATER SUPPLY

PURO SANITARY DRINKING FOUNTAIN CO.

127 Main Street HAYDENVILLE, MASS.

Seven Sizes
$950 to $4350

There is a KisselKar Truck to Exactly Suit Your Needs

The new line of Kissel Kar Trucks was designed to meet every haulage requirement.

There is one to fit *your* business—to exactly suit the peculiarities of your delivery problems.

No necessity to adjust your system to the truck—the truck will adjust itself to your system.

KISSELKAR TRUCKS

The new series is priced as follows:

1000 lb. Delivery	$ 950
3/4 to 1 ton truck	1500
1 to 1½ ton truck	1750
1½ to 2 ton truck	2100
2½ to 3 ton truck	2750
3½ to 4 ton truck	3350
6 ton truck	4350

Our new truck portfolio is ready with full specifications and details, besides hundreds of illustrations. It is sure to interest you—send for it today.

Kissel Motor Car Company,

528 Kissel Ave., Hartford, Wis.

New York, Boston, Chicago, St. Louis, Milwaukee, Minneapolis, St. Paul, Dallas, San Francisco, Omaha, Oakland, Los Angeles, Cincinnati, Cleveland, Detroit, Toledo, Columbus, Rochester, Buffalo, Duluth, Baltimore, Pittsburgh, Dayton, New Orleans, Nashville, Hartford, Conn.; New Haven, Troy, Norfolk, Providence, Marshalltown, Ia.; Madison, Montreal, Toronto, Calgary, Victoria and three hundred other principal points in the United States and Canada.

New Jersey, Crystal Lake. It is rumored the German Artistic Weaving Company of Pompton, are about to start an annex in this place.

*New Jersey, Morristown. Little has been accomplished by the Seyer Silk Dyeing & Finishing Company toward securing necessary financial assistance and establishing a plant, and the project has practically been given up. The concern was incorporated with authorized capital stock of $125,000 last June, and it was planned to build a skein and piece dyeing and finishing plant at Paterson or at some other suitable place.

New Jersey, New Brunswick. The Weiller Chemical Works, Perth Amboy, Dr. Earl Weiller, proprietor, have awarded the contract for the construction of a plant in New Brunswick to be completed in eight weeks.

New Jersey, Newark. A 1-story factory building, 60 by 150 feet, is to be erected at Ave. R and Newark Transfer for the American Synthetic Dyes, Inc.

New Jersey, New Durham. A charter has been granted Frank F. Pels Company with capital stock of $200,000 to manufacture silk and other textile goods. The incorporators are Frank F., Albert E. and Louis F. Pels. A concern known as Frank F. Pels & Company does a business of twisting and winding artificial silk and bleaching and dyeing cotton yarns here.

New Jersey, Paterson. The commission winding and warping business started by Lessman & Appet is now being run by the latter partner, Mr. Lessman retiring from the firm, and, it is reported, has started alone in the same line.

New Jersey, Paterson The Werbro Ribbon Company have moved their plant from the Bell Mill to the Lynch Mill on George St.

New Jersey, Paterson. The Fulton Silk Mills have moved their plant from the Brower Mill, Codwin St., to the Ashley & Bailey Mill.

New Jersey, Trenton. The Elise Mfg. Company has been incorporated with capital stock of $15,000 to manufacture chemicals by Anton H. Schroeder of Woodbine, Frank D. Pembelton of Arlington, and Andrew Pruden of Paterson.

New Jersey, West Hoboken. The Forsthoff-Dressler Weaving Company has been incorporated with capital stock of $20,000 to manufacture ribbons and other fabrics by C. Ernest Forsthoff, Harry Forsthoff and Carl A. Dressler. The new corporation takes over the ribbon weaving business of the same name established here several months ago.

New York, Mt. Vernon. A charter has been granted the Textile Waterproofing Company, with capital stock of $100,000. The incorporators are G. H. Quennand, Frank E. Sincere, and others.

New York, New York City. The Kingston Silk Mills, Inc., have been granted a charter with capital stock of $10,000. The incorporators are Max Silverman, Peter Landau and Regina Bauman, all of New York.

MILL NEWS.

*Pennsylvania, Chester. Construction contract has been awarded by the Thurlow Worsted Mills, owned by Fred Wolstenholme, Letitia St., Philadelphia, for the erection of a 3-story brick, steel and concrete building. It was reported recently that W. E. S. Dyer, mill architect and engineer of Philadelphia, was preparing plans for the enlargement.

*Pennsylvania, Philadelphia. It has not been decided just what changes will be made in the Fern Rock Woolen Mills by the Cleveland (Ohio) Worsted Mills Company, who recently purchased the property. A decision will probably be reached in the matter and plans made within a few days. The plant will be operated by the Cleveland concern under the name of the Fern Rock Woolen Mill Company Branch of the Cleveland Worsted Mills Company.

*Pennsylvania, Philadelphia. A charter has been granted Henry Brown & Sons Company with capital stock of $200,000 to manufacture hosiery and knit goods. Victor W. Wills is treasurer. It was noted some time ago that application would be made for a charter for Henry Brown & Sons Company and the new concern would conduct a manufacturing business in the Model Mills, Ontario and I Sts., where full fashioned machinery would be installed for making a line of cotton, mercerized and silk hosiery.

Rhode Island, Bridgeton. The Premier Worsted Mills have resumed manufacturing, after a shut down of two weeks, during which time a new boiler was installed, and other improvements and repairs made.

*Rhode Island, Centredale. A floor in the Centredale Worsted Mills, formerly used for storage, has been equipped for reeling and spooling. The Centredale Worsted Mills in Centredale and Stillwater are running night and day.

*Rhode Island, Westerly. Besides installing two new mules the Pawcatuck Woolen Mills will make improvements which will increase the capacity of the card room and the finishing room.

Vermont, Ludlow. F. W. Agan, manufacturer of shoddy and wool extracts, is making extensive repairs and improvements, including the installation of a 30 h. p. steam engine and the laying of a cement floor in the basement of the main building.

*Vermont, Springfield. Equipment to be installed by the John T. Slack Corporation in the new 2-story mill, 350 by 57 feet, recently completed, will give them 49 sets of cards and 42 pickers. They are manufacturers of wool shoddies.

Wisconsin, West Bend. Plans are being made for additions and improvements by the West Bend Woolen Mill to include the construction of a new building, 44 by 70 feet, to be equipped as a dyehouse, picker room, engine and boiler room, and addition 56 by 100 feet for carding, spinning and weaving.

ROOT COUNTERS

ARE SMALL IN THEMSELVES

BUT ARE

A BIG HELP

TO

Cotton Manufacturers

Capacities 10,000 to 10,000,000

Root Counters

help you to prevent disputes with employees when on piece work—prevent errors in production on quantity orders—prevent waste of material, resulting from overproduction.

It doesn't matter whether you want to count the output of a loom, a folding machine, braiding machine or any other textile machinery in your mill, you can get the exact count, mechanically accurate, with a Root Counter.

If your needs are peculiar and entirely different from others we can produce a Counter that will meet your wants. Root Counters operate to left or right; forward or backward; continuous or repeat.

If you want absolute accuracy in counts with all the savings that this means just remember—

There's a Root Counter for Every Textile Use

If you have a counting problem put it up to us

Send coupon now for catalog showing Root Counters counting textile products

C. J. Root Co., 100 Morey St. Bristol, Ct.

Gentlemen:

Please send Catalog No. 18.

We want to count.....

We want.....

SIGN ON MARGIN BELOW

Better Work With No Increased Cost

The use of

Wyandotte Textile Soda

and

Wyandotte Concentrated Ash

is not limited to one department of the mill, but the principle which they represent may be profitably applied to several different processes.

Doubtless in all your experience you have never used any article of an alkali nature that could be applied to so many purposes as are claimed for ***Wyandotte Textile Soda*** and ***Wyandotte Concentrated Ash,*** and because of the unusual nature of these claims it is appreciated that they must be proved before you can be asked to accept them.

All we ask is that you withhold your decision regarding these products until you give them a trial. The satisfaction which you feel after trying them will do the rest. We have no doubt of your continuing in their use because they do the things you want done—the things you never could do with other alkalies.

Ask us to "show you!" Further information furnished for the asking.

Order from your supply house.

The J. B. Ford Co., Sole Mnfrs., Wyandotte, Mich.

Welcome to the Wyandotte Booth—Panama-Pacific Exposition
Agricultural Bldg., Block 6, Cor. Ave. A and 3rd St.

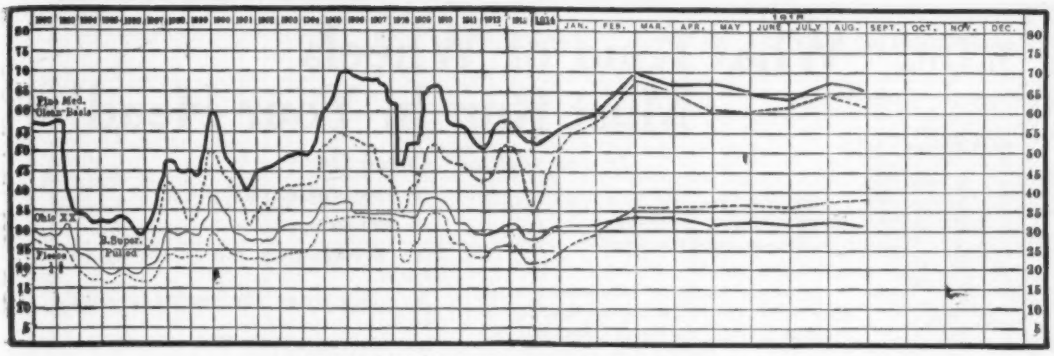


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

THE WOOL MARKET

There has been a perceptible slackening in the volume of business transacted in American markets, but without any weakening in prices. The rumors regarding England and the embargo on crossbreds have probably led some cautious traders and manufacturers to keep out of the market anticipating that a resumption of imports would enable them to buy wool at lower figures. Well informed observers are inclined to believe, however, that there will be no relaxation of the embargo on wool or at least that no change great enough to affect the market will be made by the British Government. It is possible that the British authorities might allow a small quantity of wool to be exported to the United States, if a surplus over British needs should be found to exist. Even in such a contingency the amount would at the best be small. The wool goods market is firm and mills are fairly busy, some of them being supplied with orders to cover the full capacity of the machines. New contracts for foreign military goods have been reported. Woolen mills are in a somewhat better position than are their worsted competitors. There have been fair sales of territory wool since our last report and considerable activity has developed in scoured wool, both domestic and foreign.

MILL NEWS

*Massachusetts, Millville. Construction work is to be started at once on the new shoddy mill to be built by Carroll Brothers. It is expected that manufacturing will be started in six to eight weeks. The men interested are Stanislaus, John and Thomas Carroll. Geo. Carroll of the J. B. Farnum Company of Woonsocket is not interested as previously stated. A site of about five acres has been purchased and a wooden and brick mill 100 by 50 feet is to be put up. The new concern will confine its efforts to the manufacture of shoddy and it is not intended to install any looms.

*Pennsylvania, Espy. Manufacturing will be started in about two weeks by the Riverdale Worsted Mills, Inc., with one comb, 2,000 spindles (Bradford System) on worsted and artificial silk yarns for weaving and knitting, sizes from 1s roving to 2/40s will be manufactured. The new company was organized with capital stock of $10,000. Thomas Williams is president, agent and buyer, C. R. Stauffer is treasurer. Electric power will be used. A building has been remodeled for the new concern.

Pennsylvania, Philadelphia. A. J. Pero, formerly connected with the Vervia Worsted Mills as superintendent, has installed 20 broad looms in the tenement mill at 1543 Ruan St., Frankford, which he is operating on woolen and worsted fabrics on a commission basis.

TETRAZO COLORS
FOR COTTON

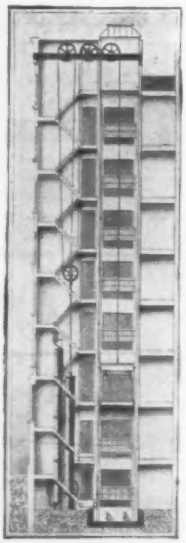
We offer these products in all shades for the dyeing of cotton in any form.
Among them will be found colors specially adapted to meet the various requirements of fastness to light, washing, cross dyeing and fulling.
Shade cards and samples, with full information, cheerfully furnished on application.

AMERICAN DYEWOOD COMPANY
NEW YORK PHILADELPHIA BOSTON HAMILTON, ONT.

Nearly 2000 in Daily Use

What Kind of Wheels Must Run In Your Head!

If you fail to "Catch On"



Elevator in Large Soap Factory in Jersey City

"Pop and the Boys" have been running the shop for over 50 years.

Bradstreet marks us K. A.

So we are good for anything we say or do.

Nearly 2000 users like **Standard Oil Co., General Electric Co., American Car & Foundry Co., Procter & Gamble** (Ivory Soap), **H. J. Heintz Co.** (57 varieties), **Meritas Mills, Jos. Benn & Sons, National Silk Dyeing Co., Summit Thread Co., Rambo & Regar, Shackamaxon Worsted Mill, Ivins Dietz & Metsgar Co., John Wanamaker, International Harvester Co.,** and hundreds more to shout "Amen" to all our preachments.

And this Guarantee:—

1. An elevator that runs at virtually no cost.

2. Absolutely Fool Proof.

3. No Repairs.

4. Always goes and at any speed desired.

5. Goes when the engine is shut down.

6. Guaranteed for life.

NO PAY UNTIL IT MAKES GOOD.

When a man has steam available and goes off and buys any other elevator we look at him with perfect amazement and wonder.

What kind of wheels he has in his head.

We wonder how his head works operate and how he holds his job.

All over this land concerns that have steam and brains

Hook'er to the Biler

CRAIG RIDGWAY & SONS CO., Coatesville, Pa.
Elevator Makers to Folks Who Know

BLEACHERS!

Suggest to your mill—
to look into Peroxide bleaching.

Call on us for a thoroughly worked-out, practical, economical description.

This is a fair warning!

Other mills are getting busy on this matter.

If you are not posted when the call comes your value is so much decreased.

THE ROESSLER & HASSLACHER CHEMICAL CO.
NEW YORK

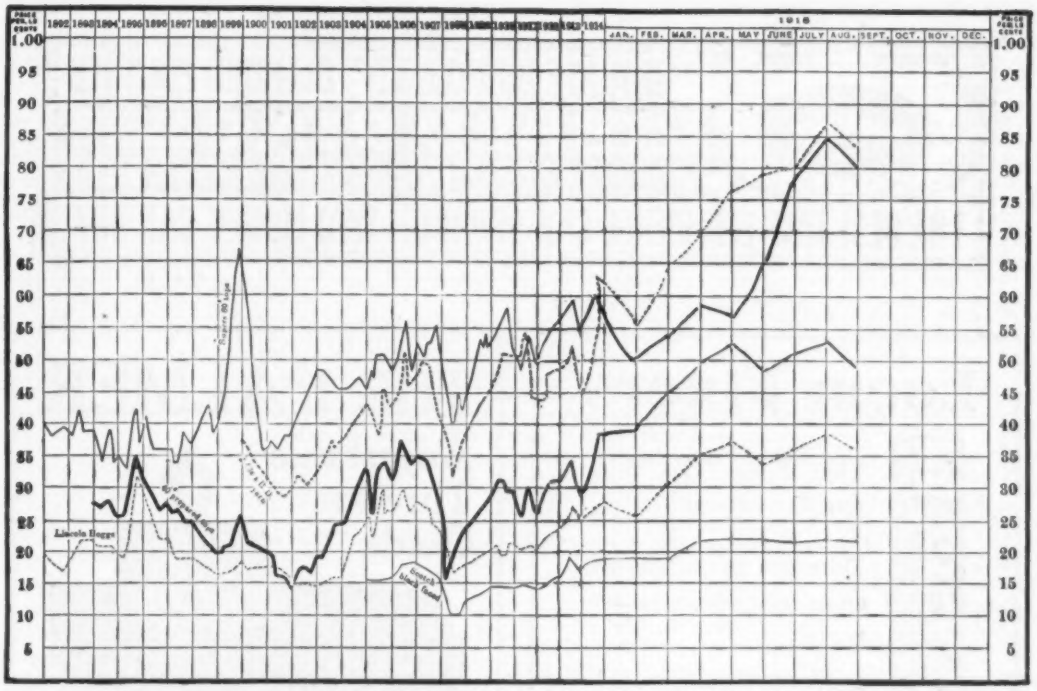


CHART SHOWING COURSE OF PRICES FOR WOOL, TOPS, AND WORSTED YARN AT BRADFORD, ENGLAND

THE BRADFORD MARKET

Bradford, Eng., Aug. 25, 1915.

A strike of combers' operatives which threatened the continuity of work has been avoided and machinery of all kinds is running at full capacity. There has been an absence of new buying that has induced a fall in the price of tops, for topmakers have not cared to neglect opportunities of realizing the still handsome profit obtainable between raw and combed wool. The fall in crossbreds cannot be expected to have important influences upon the price of yarn during this year, as spinners have sold all their production. Crossbred yarn is in a stronger position than merino as the demand has been heavily reduced by the inflation of values. The dress and gabardine trades are good, but business in fine coatings is on a much lower scale than usual.

British wools are being bought in by country dealers at prices higher than could be fetched today. Forty cents net has been paid to Border farmers for North hoggs on the strength of the opinion that all wool will be wanted as it was last year. However, it seems more certain that the short wools will improve in value, for the knit goods trade has better prospects of army orders than the cloth market.

The storage of import wool has become a serious trouble. Wool is imported into this country that went formerly to the Continent and its export is cut off. Bradford warehouses are full, and the London accommodations are choked. The Admiralty have given notice that they will clear out the wool warehoused in London to places of their own choice if it is not removed immediately. Much wool bought months back is lost in the mass and is for the present inaccessible. There is still great tension upon the facilities for combing.

New York, Brooklyn. The Oriental Knitting Mills is the name of a new concern starting at 277 20th St., in the manufacture of sweaters, caps and sashes.

*New York, Falconer. All of the old machinery has been taken out of the Ferncliff Worsted Mills of the Cleveland (Ohio) Worsted Mills Company, and the plant is being equipped throughout with entirely new worsted machinery of American make, which will increase the capacity about 40 per cent. The total spinning spindles will be 10,000, on which 2/20s to 2/50s yarn will be made. The combs will be all removed to Cleveland, making the local mill a strictly spinning plant, carrying on the processes from the top of the finished yarn.

THE DOUBLE, BURNISHED OR DIAMOND FINISHED

RIBBED RING WHITINSVILLE

MADE BY THE WHITINSVILLE SPINNING RING CO. MASS.

THE BEST THAT EXPERIENCE CAN PRODUCE, THAT MONEY CAN BUY

Loom Fixers

Your Supply Box is incomplete without it.

Does not fly around and make grease spots on your warps.

Sold on merit only, as the price is higher than most.

Write for free half pound, or to save time, order 30, 50 or 100 lbs.

Sole Makers

STEPHENSON MFG. CO.

Albany, N. Y.

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Adjustable Thread Guide

Cheapest to Buy

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Easiest to Adjust

Absolute and Rigid Adjustment

Mail Guide Block for Free Sample

Patented and Manufactured by

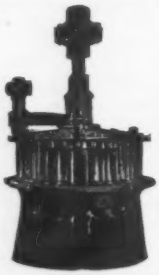
THE I. E. PALMER CO.

MIDDLETOWN, CONNECTICUT

THE SAMSON TURBINE WATER WHEEL

AND WHY IT IS BEST IN

POWER, SPEED AND ECONOMY



The Leffel Wheel, now developed into the Improved Samson Turbine, will continue to maintain, as it has for the past 49 years, its superiority because of features that give it wonderful power and high velocity, economy in the use of water, and an unusual steadiness of motion under variable gateage.

These are points of merit established by scientific and experimental tests.

Send for catalog illustrating and describing the different types and proving their merit

The James Leffel & Co.

502 Lagonda St. Springfield, Ohio

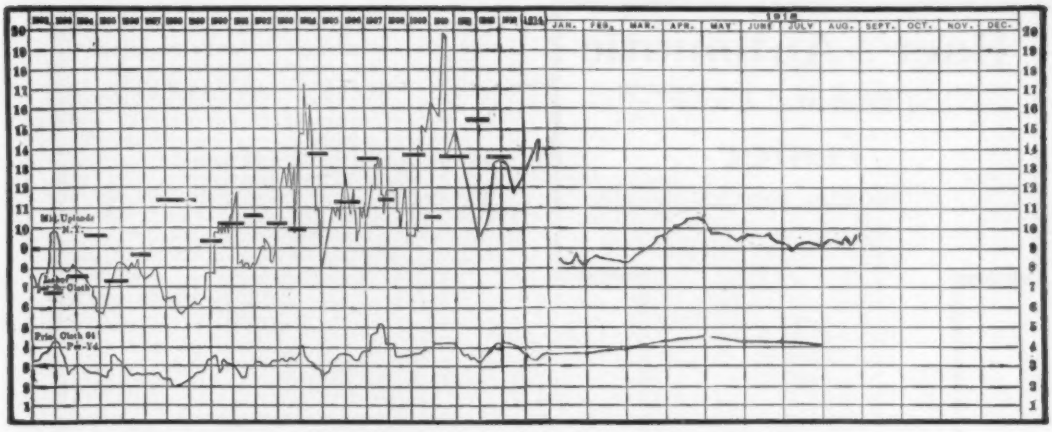


CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

The short, heavy, horizontal lines indicate the size of the cotton crops in millions of bales.

THE COTTON MARKET

The changes in cotton prices since our last report have been within narrow limits and due to political and weather reports. The contraband order by the Allies caused but a slight flurry The trade quickly settled down to a recognition of the fact that the contraband order made but a slight alteration in the situation already prevailing on the high seas. The complication over the sinking of the Arabic was a far more influential factor in shaping the trend of the market, but even this failed to move prices materially.

The movement into sight is reported by the "Chronicle" from Aug. 1 to Aug. 27 as follows:

Year	Bales
1915, Aug. 27, ...	341,015
1914, Aug. 28	251,596
1913, Aug. 29	472,597
1912, Aug. 30	478,766
1911, Sept. 1	566,511

The same authority estimates the world's visible supply of cotton on Aug. 27 at 3,890,549 bales, as compared with 2,876,701 bales on the corresponding date in 1914, 2,050,309 bales in 1913 and 2,126,585 bales in 1912.

MILL NEWS

*North Carolina, Concord. The campaign to secure subscriptions for the new mill project launched by F. J. Heywood and W. G. Broadfoot, treasurer and superintendent, respectively, of the Brown Mfg. Company, has been successfully completed and the desired amount of $100,000 has been secured. A charter has been secured under the style of the Norcott Mills Company with authorized capital stock of $250,000, the incorporators being C. W. Johnston, president of the Highland Park Mfg. Company of Charlotte, and Messrs. Heywood and Broadfoot. A meeting will be held shortly to perfect the organization. A site near the Brown Mills has been secured and preparations for the construction and equipment of a plant may be started at once. As noted previously, it is proposed to build and equip a 10,000 spindle mill to make 24s hosiery yarns.

*North Carolina, Gastonia. Preliminary construction work has been started on the plant for the new Rex Spinning Company and if present plans are followed the mill will be equipped, and everything in readiness for manufacturing by January. Combed yarns, 40s to 100s, will be manufactured on equipment of 12,288 ring spindles, driven by electric power. J. H. Mayes has been elected president; W. M. Boyce, treasurer; and C. M. Dunn, manager. The product will be sold direct. Reports of the organization of this new concern have been given previously.

*North Carolina, Granite Falls. The Falls Mfg. Company has been organized with authorized capital stock of $200,000. About $50,000 has been subscribed. This project is headed by D. H. Warlick, secretary and treasurer of the Dudley Shoals Cotton Mill Company, who it has been reported previously was organizing a new company to build a 5,000-spindle mill at Granite Falls. Practically all the capital subscribed has been raised in Granite Falls and Hickory. It is understood that a $100,000 plant will be built and equipped to make 30s cone yarns. This is the third cotton manufacturing company to be organized within the past few months in the Charlotte district.

North Carolina, Winston-Salem. The P. H. Hanes Knitting Company will build a new mill to be known as No. 4, at Hanes, several miles from Winston-Salem. Construction contract has been awarded to the Travers Wood Company, Richmond, Va., for a building 2 stories high, 300 by 127 feet, of brick and steel, and 35 cottages for employes.

Baer's Automatic
Yarn and Cloth
Tester
MOTOR DRIVEN

Sold Exclusively Through
ALFRED SUTER
Textile Engineer
200 Fifth Ave., New York

The Metallic Drawing Roll Co.
INDIAN ORCHARD, MASS.
MANUFACTURERS OF
Metallic Rolls

Especially adapted for Cotton Mills. 25 to 33 per cent more Production Guaranteed. Weight Reduced 33 to 50 per cent. No Leather Covering Bill.
WRITE FOR PARTICULARS

Alabama, Athens. Two new spinning frames and a preparatory frame will be installed in the Fulton Cotton Mill for spinning coarse yarns. New winding machinery was recently installed.

*Alabama, Florence. Changes and improvements in the equipment of the Ashcraft Cotton Mills, recently noted, will include the installation of 160 new automatic looms.

Alabama, Montgomery. New carding and spinning machinery is being installed by the Montala Mfg. Company, and many of the old looms are to be thrown out and replaced by automatic looms. Sheetings, shirtings and drills are manufactured and the plant has been recently running overtime.

Connecticut, Middletown. It is reported that construction contract has been awarded by the Russell Mfg. Company for a 1-story addition, 80 by 488 feet with an ell, 30 by 320 feet, of reinforced concrete. A second addition, 60 by 80 feet, is to be built to one of the concern's other factory buildings.

Georgia, Augusta. Construction contract has been let by the Riverside Mills for the erection of three warehouses, 53 by 150 feet each.

*Georgia, Columbus. New machinery for the Hamburger Cotton Mills has arrived and is being set up, and the plant will probably resume manufacturing next month. This concern was recently reorganized and it has been noted that 4,000 spindles would be added.

*Georgia, Forsyth. A new corporation to be known as the Forsyth Cotton Mills is to be organized to take over the Star Cotton Mill. It was known recently that the interests of B. F. Hill, the secretary and treasurer, had been sold. The incorporators of the new company are R. P. Brooks, R. T. Persons, G. Ogden Persons, and J. W. Newton, all of Forsyth. New machinery is to be installed to enlarge and improve the output.

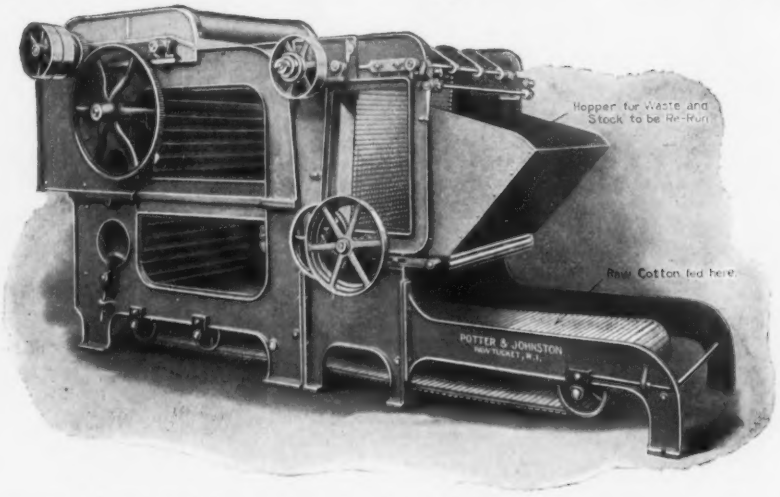
*Georgia, Griffin. New machinery comprising the increases at No. 2 Mill of the Kincaid Mfg. Company is being installed and the operation will be completed and the new equipment in operation about September 1. The new equipment includes 2 slashers, 160 looms, 8,500 spindles and preparatory machinery for making cotton towels, practically doubling the output of No. 2 Mill department.

Georgia, Macon. Since the first of the year the Bibb Mfg. Company is reported to have expended about $200,000 for enlargements and new machinery.

*Georgia, Thomaston. It is reported the enlargements being made by the Thomaston Cotton Mills, which have been under way since last March, will be larger than originally planned and that about $500,000 will be expended.

*Kentucky, Louisville. Enlargements and improvements being made by the Puritan Cordage Mills, manufacturers of cotton cordage, consist of increasing the floor space in the spinning room and finishing department, and giving a general increase in the equipment and output. The capital stock of this company is $150,000. Charles T. Wolfe is president, agent, superintendent and buyer, and G W. Babcock is treasurer.

Insure your Yarn against Variation



Every modern mixing room should contain our combination

Bale Breaker and Stock Mixer

With it you can run card sliver, low grade or short staple cotton, waste mixtures, or colored cottons with your regular stock—and in any desired proportions. This machine, the pioneer of its kind, guarantees a perfectly mixed stock—absolutely uniform in quality.

Our illustrated literature will prove of interest to you.

Potter and Johnston Machine Co.

Pawtucket, R. I.

Specialists in Cotton Mill Machinery

Pickers and Revolving Flat Cards
Potter & Johnston Machine Co., Pawtucket, R. I.

Drawing and Roving Frames
Woonsocket Machine & Press Co., Woonsocket, R. I.

Ring Spinning and Twisting Frames
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Easton & Burnham Machine Co., Pawtucket, R. I.

Northern Representative, L. W. CAMPBELL
100 Summer St., Boston, Mass.

Southern Representative, J. H. MAYES
Independence Bldg., Charlotte, N. C.

MERCERIZED YARNS

Dyers, Bleachers, Gassers

Dyers of Colors Fast to

SUN AND BLEACHING

Aberfoyle Manufacturing Company

CHESTER, PA.

402 Morris Building
Philadelphia

746 Insurance Exchange
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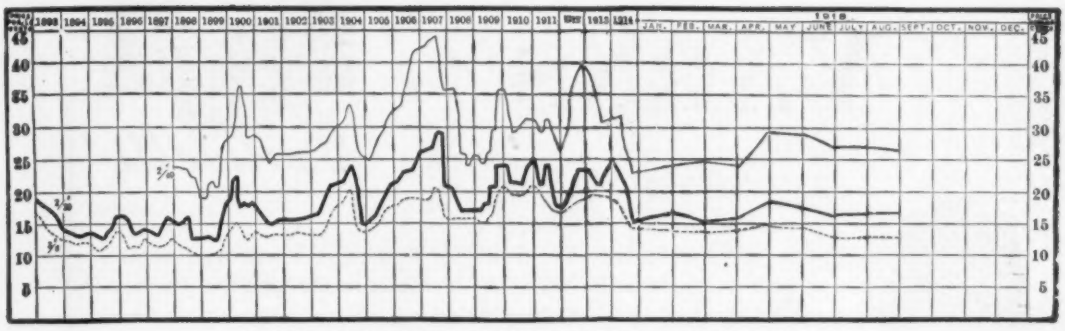
Yarn Department



GRAPHIC CHART SHOWING RANGE IN THE PRICE OF COTTON YARN TO DATE.

COTTON YARN MARKET

The cotton yarn market towards the end of August showed a tendency to advance, with spinners not at all disposed to accept business at lower quotations. The dyestuffs situation continues critical, but some lines of goods are adapting themselves to the available supplies of dyes. It looks as if the dyestuff situation would not have as much effect on the price of yarns as was expected. There have been some purchases of yarns in fairly good-sized quantities with an increase in inquiries. Many manufacturers are disposed to delay covering on their requirements believing that the embargo on cotton may lower prices. Some of the manufacturers are making the claim that while the market has stiffened during August prices cannot help but decline when the spinner takes into consideration the amount of cotton which will be on the market. Others believe that this influence has already been discounted and that the cotton purchased for American mills will offset the loss of European buying and prevent any break in prices.

Warps are selling at 25 to 27 cents for 2/40s; 2/30s warps, 20 1/2 to 21 cents; 2/20s warps 17 1/2 to 18 cents; 2/16s skeins out of stock, 16 cents, with spinners asking the same price; 3/8s tubes, 13 to 13 /12 cents; 10s frame spun, 15 to 15 1/2, with high grade yarns in the same count at 16 cents; Southern mule spun, 16 to 16 1/2 for 10s. Frame spun can be bought as low as 18 1/2 cents for 24s with market prices ranging from 19 to 20 cents.

Some houses report good purchases from the mills. The weaving lines show a marked improvement while the knitters are rather slow in making purchases. Trade in hosiery and underwear is depressed.

Eastern Cops

6s	15¾
8s	15¼
10s	16¾
14s	16¾
16s	17¾
18s	18¼
20s	18¾
22s	18
24s	18¾
26s	20¼
30s	21¼
34s	23
36s	24
40s	25
12s	17½
14s	18
18s	19
20s	20
24s	21
26s	22
30s	23
36s	25½
40s	27½
45s	31½
50s	33½
55s	39½
60s	42½

Eastern Two-Ply Warps, Carded Peeler

2/30s	23½
2/36s	25
2/40s	28
2/45s	32½
2/50s	34½
2/60s	43½

Massachusetts, New Bedford. A second story is being built on a one-story building of the New England Cotton Yarn Company. H. T. Bulman is the contractor.

SPUN SILK YARNS

We specialize on 2 and 3 ply Spun Silk Yarns in all sizes put up on cones, tubes, spools or skeins in the grey or dyed. Let us figure on your requirements.

Nonotuck Spun Silk is made in the same mill, under the same careful supervision as the famous Corticelli Spool Silk, which has won 40 Highest Awards for superiority at Expositions at home and abroad. Send for samples.

Nonotuck Silk Company

Corticelli Silk Mills Established 1838 Florence, Mass.

THE J. R. MONTGOMERY CO.

Windsor Locks, - Conn.

MANUFACTURERS OF

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools, Tubes and Cones. In Fancy Twist, Colors and Printed.

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

MONUMENT MILLS, HOUSATONIC, MASS.

HIGH GRADE COTTON YARNS White, Colors, Bleached

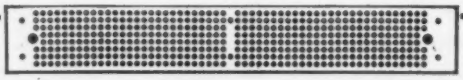
On Beams, Jack-Spools, Cones, Skeins and Chain Warps

FAST-BLACKS & COLORS { For Woolen Mills a Specialty } WE SELL DIRECT

PRESS PAPER

HIGHEST GRADE BEST VALUE

Mills RAINBOW, CONN.



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THE PHILADELPHIA MARKET

7s and coarser	15
8s and 9s	15
10s	15½
12s	16
14s	16½
16s	17
18s	17½
20s	18
22s	18½
24s	19-19½
26s	20
30s	21
40s	26
50s	34

Southern high grade mule yarns:—

Cones

10s	17½
12s	18
14s	18½
16s	19
18s	19½
20s and 22s	20½-21
24s	22

Southern frame yarn, lower grades:—

6s and 8s	14¾
10s	15

Eastern cones (high grade quality):—

10s	18
12s	18½
14s	19
16s	19½
18s	20¼
20s and 22s	20¾-20¼

Skein yarn (mostly Southern):—

4s and 8s soft	15
10s and 12s	15-15½
14s and 20s	16-17
22s	17½
2/10	15
2/16	16
2/20	17
2/30	20
2/40	26
2/50	33
2/60	40
2/8	15
6/7	15

Southern warps:—

1/10	14½
1/14	15
1/16	15½
1/20	16
1/22	16½
1/26	18½
1/30	21
2/8	15
2/12	16
2/14	16½
2/16	17
2/20	18
2/26	19½
2/30	20½
2/40	27
2/50	33

JOHN F. STREET & CO.

Cotton Yarns

PROVIDENCE, R. I.

Providence, Chicago, Philadelphia, New York

Fred Sternberg & Co.

530 BROADWAY, NEW YORK

MERCERIZED GLAZED GASSED } COTTON YARNS

C. MOORE & CO.

Manufacturers of

Twines, Threads and Yarns

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JAMES E. MITCHELL CO.

COMMISSION MERCHANTS

COTTON YARNS

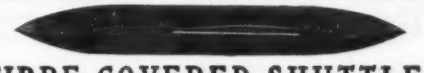
122-124 Chestnut Street, - - - Philadelphia, Pa.
Brown Building, 185 Summer Street, - Boston, Mass.

Reels for Cotton WOOLEN AND WORSTED

Patented Hosiery Winders, Cop Winders and Spoolers

LINDSAY, HYDE & CO.,

2124 to 2130 E. York St., PHILADELPHIA, PA.



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OTTO KUNZE, 2542 Seventh Ave., New York.

S. T. Crocker, Pres. W. F. Stiles, Treas.

ORSWELL MILLS

FITCHBURG, MASS.

Capacity, 45,000 Spindles

HIGH GRADE YARNS

From Egyptian and Peeler Cotton, Carded or Combed, in Chains and Skeins, on Balls, Beams, Spools, Cops, Cones, Tubes, Single or Twisted

JENCKES SPINNING COMPANY

PAWTUCKET, RHODE ISLAND

COTTON YARNS

CARDED and COMBED, in Nos. 10 to 120, from PEELER EGYPTIAN and SEA ISLAND COTTONS
MERCERIZED YARNS, IN SINGLE OR PLY, A SPECIALTY

LINDSAY THOMPSON & CO., LTD.

FLAX SPINNERS BELFAST, IRELAND

Linen Weaving and Knitting Yarns

LINEN THREADS OF EVERY DESCRIPTION

T. J. PORTER & SONS Large Stocks
Selling Agents, Philadelphia Quick Delivery

HUGHES FAWCETT

115 and 117 Franklin St., New York

Linen Weaving and Knitting Yarns

Linen Jacquard Harness Twines

And Linen Yarns and Threads for every purpose

Turkey Red Yarns

LARGE STOCK PROMPT DELIVERIES

Industrial Tape Mills Co.

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Manufacturers of

NARROW FABRICS

SPOOL TAPES. STAY BINDINGS AND BRAIDS

Also Sole Manufacturers of

SAXON

New Guaranteed Non-Shrinkable Tape

F. W. MAURER & SONS CO.

MANUFACTURERS OF

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Office and Factory: WAYNE AVE. and BRISTOL ST.
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WRITE — FOR SAMPLES AND PRICES ON SEWING AND SPLICING THREADS IN ALL COLORS TO

TO FLORENCE THREAD CO.
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HOSIERY AND UNDERWEAR MAKERS WHO WANT TO MATCH COLORS - WRITE

WEIMAR BROS. MANUFACTURERS OF **Cotton Mercerized Tapes**

SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES

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The Ramie Agency

Manufacturers' Agents

New York

Ramie Yarns and Threads

HAVE REMOVED
TO NEW AND LARGER QUARTERS AT

432 FOURTH AVE. Corner of 29th St.

THE LINEN YARN MARKET

It is extremely difficult to give an accurate report regarding the Irish market. Yarns still continue to advance. The government demands for cloth have increased the demand for heavy line and tow yarns which are very scarce. It is difficult to purchase them for private orders, as government requirements have the call. Spinners and commission houses have cleared up their stocks and it is with great difficulty that spinners can see their way clear to name prices for future delivery. Where immediate delivery is required it is well nigh impossible to secure even small lots of yarns. Orders have been entered up for future delivery, but no fixed date for delivery can be given and prices continue to advance. Delivery of 25s to 35s tow yarn is almost impossible, with the result that prices are marked up to their extreme value. Following is a table showing the advances that have occurred on certain counts during the past twelve months.

Linen Wefts

Aug.	25	28	30	35	40	45	50
1914	$1.98	$1.74	$1.62	$1.47	$1.35	$1.26	$1.20
1915	3.57	2.94	2.70	2.46	2.16	2.04	1.80

Tow Yarns

Aug.	16	18	20	22	25	28	30
1914	$2.25	$2.01	$1.86	$1.71	$1.59	$1.53	$1.47
1915	3.99	3.66	3.30	3.06	2.82	2.64	2.34

"A" Quality)

35s Lea on cones	1.05
50s Lea on cones	1.10
60s Lea on cones	1.15
80s Lea on cones	1.20
90s Lea on cones	1.30
100s Lea on cones	1.45
110s Lea on cones	1.55
120s Lea on cones	2.00

Massachusetts, Northboro. The woolen mill formerly operated by the Woodside Mills, which has been idle for some time, has been sold at public auction to Clair S. Taylor, of Hope Valley, R. I., and it is understood that a new corporation is to be formed under the name of the Woodside Mills, Inc., to start up the machinery on men's wear woolens. The old Woodside Mills will retire from business. John P. Leary states that particulars of the new corporation will be available within a short time.

New Hampshire, West Concord. The Concord Worsted Mills, Thomas Hodgson and Samuel W. Briggs, have resumed manufacturing after a period of idleness. Worsted yarns are manufactured on the Bradford system.

West Virginia, Martinsburg. The Dunn Woolen Company will resume manufacturing at once, after an idleness of two months. This is a new concern organized last fall which started up the mill of the old Martinsburg Worsted & Cassimere Company on war orders for blankets.

An Accurate and Sensitive Balance for Textile Use

Working parts and graduated beam enclosed in glass metal case.

Style No. 5020

For further particulars mention Style No. 5020.

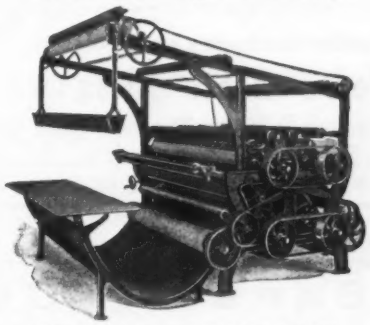
Torsion Balances used by National, State and Municipal Governments, United States Appraisers Stores, Manufacturers and the trade. *Write for Textile Pamphlet.*

THE TORSION BALANCE COMPANY

Factory, Jersey City, N. J. Office, 92 Reade St., New York

Pacific Coast Branch - San Francisco, Cal.

Wool Burring and Picking Machinery
Cloth Finishing Machinery



Worsted Sanding and Polishing Machine

Curtis & Marble Mch. Co.
WORCESTER, MASS.

MILL NEWS

Massachusetts, North Adams. It is possible that an addition will be built to the plant of the Greylock Mills within a year. The new equipment to be installed before the first of September will give about 20 per cent. increase in the capacity.

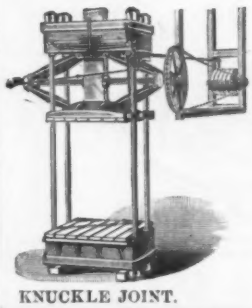
Massachusetts, West Warren. New machinery is to be installed in No. 3 Mill of the Warren Cotton Mills. It is understood that arrangements for this new equipment are now being made.

*North Carolina, Asheville. Additions and improvements being made at the plant of the French Broad Mfg. Company are progressing favorably and it is expected they will be completed about October 1. A new spinning mill, 200 by 100 feet, 2 stories and basement, to be equipped with 5,000 spindles, a new reinforced concrete storehouse, 100 by 50 feet, 4 stories high, and an extension of the present bleachery, comprise the changes. Electric power will be used and will be purchased from the North Carolina Electric Power Company. C. S. Wright is manager and buyer.

North Carolina, Charlotte. Four thousand spindles with preparatory machinery will be added to the equipment of the Robinson Mfg. Company, and contracts have been awarded. Last December this company was organized with authorized capital stock of $100,000 and the building formerly occupied by the Charlotte Cordage Company was taken over and remodeled and 3,500 spindles, electric motors, etc., were installed for making 10s to 20s hosiery yarn. W. L. Robinson, who heads the concern, was formerly superintendent of the Cannon Mfg. Company's plant at Concord, and W. E. G. Robinson, the superintendent, was at one time superintendent of the Franklin Cotton Mills at Concord, and is a son of W. L. Robinson. In earlier reports of the company it was noted that plans provided for an early increase to 8,000 spindles.

*North Carolina, Edenton. Plans for the recently reported addition to the Edenton Cotton Mills are being drawn, but dimensions of buildings and details of new equipment have not been definitely arranged as yet. It has been noted that it is planned to spend about $120,000 in building a new brick mill and installing machinery which will add more than fifty per cent. to the present output. 20s to 26s warp and skein yarns and coarser waste yarns are manufactured at present. Included in the new department will be a new 500 h. p. electric power department.

North Carolina, Gastonia. A 2-story brick addition, 200 by 60 feet, is to be built at the Arlington Cotton Mills. Contruction contract has been awarded to J. A. Jones, of Charlotte.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Boomer & Boschert
BALING PRESSES
ARE THE STANDARD
Hydraulic or Knuckle Joint
Any Size Any Power
Boomer & Boschert Press Co.
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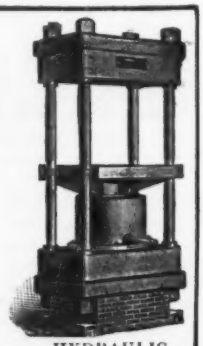
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SPANISH AGENCY
FOR
Textile Machinery and Tools
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BARCELONA (Spain)
Best references at your disposal

American Accounts Desired for
Spinning, Weaving, Finishing and Dyeing Machinery
for cotton, wool, worsted, flax, hemp, jute, silk and other fibres
Cotton and Wool Knitting Machinery
Wood and Iron Works Machinery
Steam, Gas and Electric Power Engines
Industrial Tools and Appliances Fancy Articles

B & C
TRADE MARK
BARBER-COLMAN COMPANY
MAIN OFFICE AND FACTORY
ROCKFORD ILL
BOSTON MASS. GREENVILLE S C.
HAND KNOTTERS AND WARP TYING MACHINES

North Carolina, Greensboro. One hundred and fifty new automatic looms have been added by the Pomona Mills, Inc. This is additional equipment and was added to take care of surplus yarn which had been sold on the market. No further additions are contemplated at present.

*Pennsylvania, Reading. Improvements to be made at the Reading plant of Joseph Bancroft & Sons Company will almost double the capacity of the plant. A new 3-story mill, 135 by 170 feet, will be built at 9th and Cotton Sts., a new picker house, 2 stories high, 53 by 105 feet, will be built at 9th and Laurel Sts., and two brick dwelling houses will be constructed.

Rhode Island, Albion. The power plant of the Valley Falls Company is being re-equipped with new boilers, a turbine and electrical equipment. Earlier in the year some departments were shut down temporarily on account of a break in the old turbine.

*Rhode Island, Providence. Eight more new spinning frames driven by individual motors and two new twisters are being installed in the plant of the Coventry Company at Anthony. This makes a total of 32 new frames that have been installed within the last six months, and gives an increase of about 8,000 spindles at the plant.

*Rhode Island, Woonsocket. Machinery is arriving at the large additions just completed for the Lawton Spinning Company. The new equipment will include 22,000 spindles and preparatory machinery. The larger of the two additions is 100 by 60 feet, 3 stories high, and will be used as a storehouse and finishing department. The other is 1-story high, 117 by 59 feet, and will be used as an enlargement of the carding department.

*South Carolina, Blacksburg. Business men of Blacksburg are interested in the proposed increases at the Broad River Mills and have offered inducements to the concern to enlarge the plant. It was noted recently that the concern contemplated increasing its capital and adding 10,000 spindles.

South Carolina, Charleston. Plans are being made by the Royal Mills to increase the capacity for manufacturing seamless bags and it is reported that 100 looms will be added to the present equipment. F. W. Wagener is president, E. C. Hesse, treasurer, and R. A. Burris, superintendent. Messrs. Wagener and Burris attend to the buying.

*South Carolina, Gaffney. The new building erected by the Irene Mills for a bleaching and finishing plant is about completed and equipment will be installed ready for beginning operations in this department January 1, 1916. This new building is 115 by 265 feet, 1-story and basement. The concern manufactures table damask, jacquard, towels, etc., on 4,600 ring spindles and 90 looms. H. D. Wheat is president, treasurer and buyer; W. George Hayes, secretary and J. R. Mallory, superintendent. Tatum, Pinkham & Greey, N. Y., are the selling agents.

RATS AND FIRES

72 Front Street, New York City.

To Mill Owners and Superintendents:

A serious fire was caused last month in a New England textile mill as a result of a rat having knawed off the insulation from two feed cables. Its body got across the mains in such a manner that it became thoroughly carbonized which resulted in a dead short circuit putting the power plant out of commission temporarily as well as causing a fire which might have destroyed the plant. You must be aware that no building is properly fire-proofed unless it is free from rats. We know the habits of rats and we understand how to get rid of them. We will be pleased to contract to keep your premises rid of rats by the use of the wonderful bacteriological preparation known as DANYSZ VIRUS. Write today for our latest booklet. Yours truly,

Department 4 VIRUS LIMITED INC.

JOHN E. KENDRICK, President MYRON FISH, Treasurer M. C. FISH, Secretary

American Supply Co.

Manufacturers of Reeds, Harness, Belting and General Mill Supplies

We make a specialty of Harness for American Warp Drawing-in Machine

OFFICE and STORE—135-137 Washington St., Providence, R. I. FACTORIES—Central Falls, R. I. and Fall River, Mass.

Thread and Silk SPOOLS of any description

Made from one piece, up to 6" long and 3" dia.

We are located in the best white birch region. Our work and prices seem to satisfy the most particular customers. We can give any finish desired. Estimates furnished on samples submitted

E. L. Tebbets Spool Company, Locke's Mills, Maine

SMITH & FURBUSH MACHINE CO.

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Manufacturers of

PICKERS—Lumpers; Rag, Burr, Wool, Cotton, Jute, Fearnaught and Garnett Pickers; also Rag, Carpet and Jute Shredders.

WILLOWS—Continuous Cotton Stock Opening, Cleaning, Metal Extracting and Condensing Outfit; also Square Box and Cone Willows or Dusters

GARNETT MACHINES—For carding cotton and woolen waste clippings, etc.; also for manufacturing cotton, wool and jute batting or felts.

FEEDS—Self feeds for cotton, wool, worsted or jute; also Camel Backs, Blamires and Apperlys.

METALLIC BREASTS—Burring Machines and Self-Stripping Feed Rolls for Cards and Garnett Machines.

RECLAIMING MACHINE—For Opening and Cleaning various kinds of Cotton Mill Waste.

CARDS—Woolen, Worsted, Cotton Waste, Shoddy, Hair, Asbestos and Jute Cards; also Special Cards for the manufacture of Wool Hats.

MULES—Heavy and Durable for Wool and Waste Yarn.

TWISTERS—Plain or Fancy Twisters for Flake, Loop or Bourette Yarn.

BOBBIN WINDERS—Automatic Jack Bobbin Builder and Adjustable Creel for different length spools.

WARPING MACHINERY—Copper Cylinder Warp Dressers with single and double size pans; beamers; Section and Pinless Warp Mills. Creels and Dresser Spoolers for Wool or Worsted.

GRINDERS, Etc.—Floor, Traverse and Portable Grinders for Cards, Garnetts or Rag Pickers; also Turning Rests, Fillet Winders, Card Clothing Stretchers and Cleaning Frames.

Special Circulars furnished for each Machine

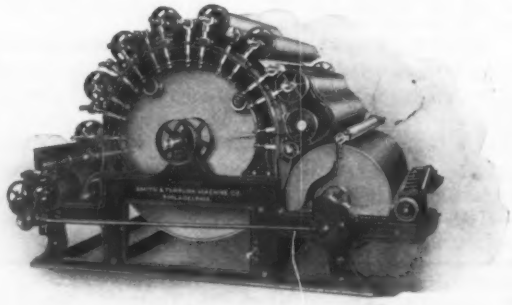
Felting Machinery for Manufacturing Soft Felts or Commercial Batts, for Mattresses, Comforts, etc from Cotton, Cotton Waste, Linters, Jute, Wool and Wool Waste

A complete line of Machinery for Manufacturing Gunny Bagging from Old Gunny Bagging
Complete Equipment for Manufacturing Mop Yarn and Rope from Cotton Waste

Estimates and complete plans furnished

CARDS

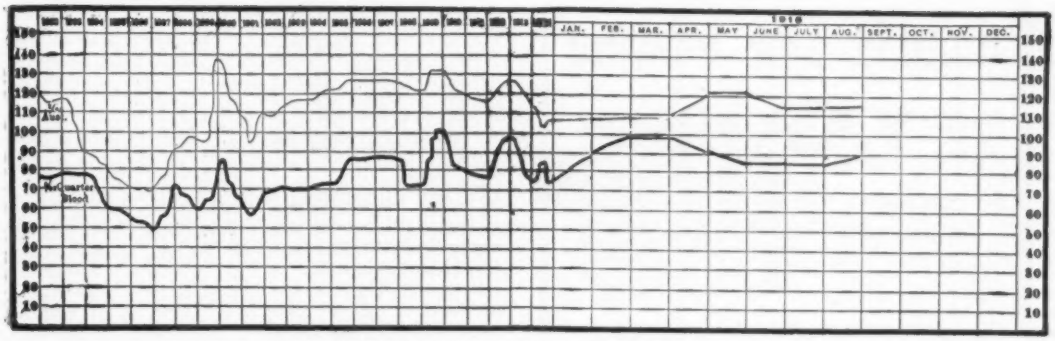
One of the large number of styles we build



Send us your specifications for Woolen or Worsted Cards

First Breaker Card,—Style No. 6

S. K. F. Self-Aligning Ball Bearings on Main Cylinders
Self-Aligning Sleeve Bearings on all cylinders
Case Hardened Journals on fast running rolls
New, light, undentable cast iron Workers
Convenient and positive adjustment
Many new and improved features



GRAPHIC CHART SHOWING RANGE IN PRICE OF WORSTED YARN.

WOOLEN AND WORSTED YARN MARKET

Spinners of worsted yarns are well employed, especially on business from the weavers of men's wear. Prices are high and firm and still going higher. In many instances both the spinner and the consumer are speculating as to how high they will go. The shortage in raw stock continues and the dyeing situation becomes worse every day, causing a tendency to hold back business. The consumers are slow to pay the advance and when they buy they do not know whether they can get their yarns or goods dyed.

The demand is mostly for 2/40s and 2/50s. While the price asked for the former count is $1.07 1/2 to $1.10, many spinners are unable to quote prices and almost all sales have been made at $1.07 1/2.

The sweater trade is in a somewhat better condition and seems to be picking up considerably. They are buying for immediate delivery, the regular yarns used in this class of goods calling for 2/10s to 2/26s. A number of contracts were placed with the spinners before the advance took place. The sharp advance in prices seems to have shut off the placing of further contracts, but it is anticipated that when the business opens they will have to come into the market at the new figures. Other branches of the knitting business are slow with very little, if anything, in the way of business coming in. So far as new business is concerned, the spinner is at a standstill. Orders can be obtained at old prices, but when yarns are offered at today's figures they are hard to get.

BRADFORD SPUN YARN

2/12 to 2/16 low common	77½-80
2/20 to 2/24 low ¼	80-82½
2/20 to 2/25 ¼ blood	82½-85
2/26 to 2/28 ¼ blood	85-87½
2/32 ¼ blood	87½-90
2/20 ⅜ blood	90-92½
2/26 ⅜ blood	92½-95
2/32 ⅜ blood	95-97½
2/36 ⅜ blood	97½-1.00
2/40 ½ blood	1.05-1.07½
2/50	1.15-1.17½
2/40 Australian	1.10-1.12½
2/50 Australian	1.20-1.22½
2/60 Australian	1.27½-1.30
3/30 and 3/32 luster	95-97½
3/36 luster	1.10-1.12½

KNITTING YARNS

Dyed and Bleached—Bradford System

2/7s straight 1/4 blood	97½-1.02½
2 and 3 ply 10s-20s straight ¼ blood	1.00-1.05
2 and 3 ply 20s-24s straight ¼ blood	1.01½-1.07½
2 and 3 ply 24s-28s straight ¼ blood	1.08-1.09

(Reduce 10c. for yarn in oil)

FRENCH SPUN YARN

1/20 1/4 blood	85-87½
1/20 high 1/4	87½-90
1/20 3/8	90-92½
1/20 high 3/8	92½-95
1/20 1/2 blood	95-97½
1/30 1/2 blood	97½-1.00
1/40 1/2 blood	1.02½-1.05
1/50 delaine	1.07½-1.10
1/40 Australian	97½-1.00
1/50 Australian	1.15-1.20
1/60 Australian	1.20-1.25
1/70 Australian	1.25-1.30

For two ply knitting twist add 5c. additional to above prices.

For two ply weaving yarns add 7 1/2c. additional to above prices.

Massachusetts, Blackstone. A 2-story addition is being built to the cloth room of the Blackstone Mfg. Company by the J. W. Bishop Company which will bring the present 1-story structure up to the height of the rest of the mill. The new part will be of brick and will be 90 by 130 feet. It is reported that some new machinery will be installed following a rearrangement of equipment to be made on the completion of the addition.

Knitting and Weaving
YARNS
Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment
EDWARD S. HYDE
226 CHESTNUT STREET
Philadelphia, Pa.

William Whitman Co.
COMMISSION MERCHANTS
COTTON and WORSTED YARNS
BOSTON NEW YORK PHILA. CHICAGO CHARLOTTE

JAMES LEES & SONS CO.
MINERVA MILLS
Spinners of WORSTED YARNS
For Weaving and Knitting
In the Grey and in all colors and mixtures
Philadelphia Office: 627-29 Bourse Bldg.
Mills and Office: Bridgeport, Montgomery Co., Pa.

J. B. Jamieson
77 Summer St., Boston
COTTON YARNS
of all descriptions
Correspondence Solicited

HAROLD R. SHIRLEY
242 Chestnut St., Philadelphia, Pa.
French Spun Worsted and Merino Yarns
Bradford Spun Yarns
Woolen Yarns
FOR WEAVING AND KNITTING

FREE, A CATALOG of all important textile books sent on request by Lord & Nagle Co., Boston, Mass.

SOAPS HIGH GRADE SOAPS
Bleaching, Fulling and Scouring
SOAPS
Red Oil and Olive Oil Crown Soaps
J. O. Draper Co. Est. 1860 Pawtucket, R. I.

FRENCH SPUN MERINO YARNS—FINE ONE-HALF BLOODS

Standard Grade

1/20 50/50 White Merino Cop	78
1/30 50/50 White Merino Cop	80
1/40 50/50 White Merino Cop	82
1/20 60/40 White Merino Cop	84
1/30 60/40 White Merino Cop	86
1/40 60/40 White Merino Cop	88
1/20 70/30 White Merino Cop	90
1/30 70/30 White Merino Cop	92
1/40 70/30 White Merino Cop	94
1/20 80/20 White Merino Cop	96
1/30 80/20 White Merino Cop	98
1/40 80/20 White Merino Cop	1.00
Sliver and Sanitary Mixes	3c. more
Coning on 1/20	2c. more
Coning on 1/30	3c. more
Coning on 1/40	4c. more

WOOLEN AND MERINO YARNS

Woolen spinners report business as much better. They have plenty of orders on their books and refuse to take contracts until after the first of the year. Orders on hand call for immediate shipment and will keep them busy until the end of December. Prices have advanced and there is no doubt that the continued rise in the price of raw stock together with the scarcity of dyestuffs will maintain the advance as the demand becomes larger. Few large orders are being placed, but the buyers are numerous and the business is steady with deliveries to begin when the orders are placed. The demand is for 2/10, 2/12, 2/20 and 2/23 cut yarns. Prices on these counts have been advanced from three to five cents per pound.

WOOLEN AND MERINO YARNS

2/20 Light Grey Mixed	80%	20%	67
2/20 Light Grey Mixed	90%	10%	72
2/20 Light Grey All Wool			77½
2/20 Colored All Wool			75-77½
2/20 Bleached	80%	20%	75-77½
2/20 Bleached	90%	10%	80-82½
2/20 Bleached All Wool			85-87½
2/23 Colored All Wool			77½-80
2/23 Bleached 90/10			82½-85
2/23 Bleached All Wool			87½-90
2/25 Light Grey Mixed All Wool			87½-90
2/25 Bleached All Wool			97½-1.00

THE RAG AND SHODDY MARKET

A strong demand for rags and shoddy has developed since our last report and prices have materially advanced. All grades are in good demand and on some the market is bare of stock. Prices are irregular owing to the active business. Shoddy manufacturers are busy, the production in some cases being covered with orders for several months in the future. Prices have advanced and

buyers have been compelled to pay materially more than the figures at which the cost of their goods was calculated. Business in wool waste is quiet as stocks are small, some grades being out of the market. The cotton waste market is unchanged and buyers find no difficulty in supplying their requirements at current quotations. We quote as follows:

SHODDIES AND EXTRACTS

White knit	38-40
Red flannel	20-22
Red knit	25-28
Thibelts	21-23
Fine dark merino No. 1	19-20
Fine light merino	29-31
Fine black merino No. 2	15-16
Light delaines	25-26
Mixed delaine	12-13
No. 1 dark worsted	19-20
No. 2 dark worsted	16-17
Black worsted	20-22
Fine dark worsted clips	23-24
Blue serge, old	22-23
New blue clip	20-22
New black fine worsted clip	28-31
Light yarn, fine	30-33
Dark mixed, fine yarn	16-20
Dark blue hosiery clips, No. 1	17-20
Dark blue hosiery clips, No. 2	14-16

NEW WOOLEN RAGS

Fine merchant tailors	16-18
Choice light worsted	23-25
Fine gray worsted	24-25
Coarse gray clips	16½-17
Fine dark worsted	17-19
Black worsted	24-25
Blue worsted	24-25
Brown worsted	19-20
Blue serge	27-28
Black serges	24-25
Light serges	24-25
Dark fancies	13-15
Dark serges	15-16
New blue flannel	20-22
New scarlet flannel	18-20

SOFTS AND KNIT STOCK

Soft woolen, best	11½-12
Red flannel	13
White softs	26-27
Merinos, fine light	20-21
Thibets	14-14½
Knit stock, red	14½-15
Light gray, underwear	11-11½
Coarse gray	17-18
Blue knit	13½
Mixed hoods	9
White knit stock	28-29

Manufacturers Want Facts

They must know exactly how many pieces each machine is turning out every day, every hour. They must have these facts at once, if they are going to keep an accurate check upon their production and their costs

Durant Counters

give you the facts on the instant, without any waiting for reports. They're made in thirty different styles, applicable to almost any kind of machines in textile mills. Simple, strong and durable.

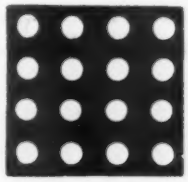
Write for Illustrated Catalog No. 30

Durant Mfg. Co., Milwaukee, Wis.

Woolen and Merino YARNS

Eaton Rapids Woolen Mills

EATON RAPIDS, MICHIGAN



Perforated Plates for Wool Washing

Rinsing and Carbonizing

In Special Metal

BECKLEY PERFORATING CO., Garwood, N. J.

SPOTS

oil, grease and other mill stains quickly and permanently removed by the Sanitex Process. Machines installed in Textile and Knitting Mills, or Spotting done for the trade at reasonable rates. The Sanitex Co., 33 Union Sq., N. Y., Dept. A.

Lowell Crayons Meet the requirements of any cotton, woolen or worsted mill.

May we send samples? 15 colors and white

LOWELL CRAYON CO. Original Manufacturers LOWELL, MASS.

TRADE MARK ON EVERY BOX

OAK TANNED LEATHER BELTING

—AND—

PICKER AND ROLLER COVERING LEATHERS

CHARLES BOND CO., 520 Arch St., Philadelphia

Leading Manufacturers Use
Cheney Silk Yarns

Silk yarns for use in silk or silk mixture goods must be of the best quality —any other may result disastrously. Cheney Brothers have, for years, supplied the leading manufacturers in the United States with silk yarns, and these yarns are of the same high quality that Cheney Brothers themselves use in making Cheney Silks. Evenness is essential, and this is assured when you buy Cheney Silk Yarns.

Furnished in the gray or dyed; organzines and trams; doubles and singles; on spools, cones or in the hank; on shuttles, bobbins, paper tubes, cones or warps; also ball warps.

Quotations and samples on request.

CHENEY BROTHERS

Silk Manufacturers 4th Avenue and 18th Street, New York

National Silk Dyeing Co.

Main Office, PATERSON, NEW JERSEY, 140 Market Street

NEW YORK SALESROOM, 60 UNIVERSITY PLACE

Skein Silk Dyeing of every description for every class of textile manufacture.

Hosiery Dye—Boil-off, weighting and dyeing, treated especially to meet the requirements of the hosiery and knitting trade.

Piece Dyeing and Finishing—All silk and silk mixed goods.

Printing—Surface and warp printing.

WORKS:

Paterson, N. J. Dundee Lake, N. J. Allentown, Pa. Williamsport, Pa.

THE SILK MARKET

Quite a sharp advance can be noted in prices, for many grades of raw silk, particularly in the Canton market. The silk market in general remains firm.

This is accounted for by the fact that there is a large demand for spot silk, and in addition to a shortage of the raw product, owing to another flood, which it is reported has nearly destroyed the fifth crop. Little or no business is being transacted in this market. In Yokohama the market remains firm with some advance in prices. Whether or not they will remain at present figures is problematical. It is stated that there are at least 7,500 bales of raw silk on hand in this market. Unless all signs fail they will be in demand.

The Italian market is reported as being fairly active, but at an advance in prices which it is stated is caused by the demand and by the weakened condition of the exchange.

It is reported that the silk mills in Lyons are busy on many lines, but their finished product is far from normal. This condition will probably continue for sometime to come.

The Shanghai market is reported as fairly active, and reelers are now quoting prices.

Manufacturers in this country are still optimistic as to the fall and spring business, and are more frequently seen in the market buying the raw product. In broad silks a good demand has manifested itself at the present time. This cannot be said of ribbons, but even these manufacturers believe that in the near future a demand will be felt for this product, owing to the styles, which are expected in the fall. Cotton manufacturers are not buying as yet much raw silk, but the hosiery manufacturers are quite active buyers, as are also the worsted and woolen mills, which have been buying in small lots.

The dry goods districts report a fair and increasing demand for the finished product, especially in broad silks. All soft finished goods are still popular, and it is expected that this condition will prevail for the coming season. Georgette crepe, Moria, Charmeuse Meteors in dark shades still have the call. Taffetas are very popular, especially in plaids. Velvets will find a ready sale the coming season.

The silk industry has taken on an activity which has not been in evidence for sometime, and manufacturers in general are hopeful that this condition will be prolonged. Below are prices current:

VILLA, STEARNS COMPANY
Telephone, 6174 Gramercy
American Woolen Building
221 Fourth Avenue, New York
RAW AND THROWN SILK
Silk on Spools, Cones, Quills, Beams
DYED SILK FOR ALL PURPOSES
Philadelphia Office:
519 Bourse Building
Providence Office:
Howard Building

SAUQUOIT SILK MFG. CO.
INSULATING AND BRAIDING SILKS
ORGANZINE, TRAM AND HOSIERY SILKS
Fast Dye Organzines for Woolen Manufacturers a Specialty
Mills: Bethlehem, Pa., Philadelphia, Pa., Scranton, Pa.
New York Representative, Wm. Ryle & Co., 225 Fourth Ave.
Philadelphia Office, 4015 Clarissa St., Nicetown
Chicago Office, 206 So. Market St.
Boston Office, 78 Chauncy St.

The President Sees a Great Light

The Superintendent explains his methods of increasing the efficiency of the operatives

"SEE the girl at that loom? She looks a little green but *she gets out the work.*

"In my first job as superintendent I learned by costly experience to judge an operative by product turned out and not by looks.

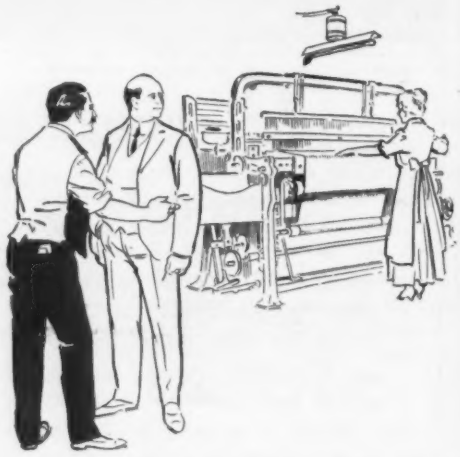
"When the proposition came up to try out Cooper Hewitt Light I applied the same method that I used in hiring help. Even if it did look a little green, it came with the highest kind of recommendations, and an offer to get out voluntarily if it didn't give satisfaction. Naturally I was willing to give it a chance to make good.

"But I put the Cooper Hewitt man up against the toughest proposition in the whole works—down in "the cooler"—you know that dark room in the old building.

"The operatives called it "the cooler" because they considered it kind of punishment to work there. Now they scheme to get in there.

"Well I had the surprise of my life. Do you know that room today is turning out more and better goods than the daylighted room above it?

"My advice is to put in Cooper Hewitt Light throughout the plant. I am fully satisfied that by so doing we can get down to a flat production curve."



This reads like a "story" but it is a true one. We can give names, date and place—and lots more of them.

Just give us a chance to prove what we say.

New edition of Industrial Lighting Bulletin No. 747 ready soon. Write for a copy.

COOPER HEWITT ELECTRIC COMPANY

General Office and Works, Eighth and Grand Streets, Hoboken, N. J.

Boston Chicago Cincinnati Cleveland Detroit Minneapolis Pittsburgh Philadelphia St. Louis

SPUN SILK

YARNS FOR ALL PURPOSES

AMERICAN SILK SPINNING CO., PROVIDENCE, R.I.

CASCAMI

SCHAPPE SPUN SILK
CORDONNETS AND NOILS
CASCAMI SILK SPINNING CO. of AMERICA,
331 4th Ave., Madison Sq. 5197, New York City

SILK THROWING and WASTE SILK SPINNING Deals with the preparation of Yarn from the Raw Silk. 158 pages; 117 illustrations; cloth. $2.50 prepaid. LORD & NAGLE COMPANY, Boston, Mass

WILLIAM RYLE & CO.,

FOREIGN AND DOMESTIC

SPUN SILK YARNS and NOILS

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

225 Fourth Ave., Corner 18th St., NEW YORK CITY

European

Grand Extra Classical Piedmont	3.70-3.75
Extra Classical Italian 12/14 12/16	3.60-3.65
Best Classical Italian 13/15 24/26	3.50-3.55
Classical Italian	3.45-3.50

60 days' basis

Japan

Filature Kansai Double Extra Cracks	3.65-3.70
Filature Kansai Extra 13/15	3.50-3.55
Filature Shinshu Extra 13/15	3.45-3.50
Filature Kansai Best No. 1	3.40-3.42½
Filature Kansai No. 1 13-15	3.30-3.35
Filature Shinshu No. 1 13/15	3.25-3.30
Rereels No. 1 13/16	3.50
Rereels No. 1 1/2 13/16	3.40
Rereels No. 1 1/2-2	3.35

6 months' basis

China

XXA Crack 14/16	2.90-2.95
Canton XXB Ordinary 14/16	2.75-2.80
Canton XXB 22/26	2.75-2.80
Tsattle Blue Dragon & Flying Horse	2.50-2.55
Tsattle Kun Kee Mars No. 1	2.25-2.30
Tussah Filature Eight Cocoons No. 1-2	107½

6 months' basis

SPUN SILK

Nothing new can be said of the spun silk manufacturers, except that they are finding the demand for their product increasing. Although it cannot be said that a normal business basis has been reached, all signs point to that goal in the near future. No change in prices for spun silk in the grey, which are quoted below:

60/2	3.60
50/2	3.50
40/2	3.40
30/2	3.25
20/2	3.15
10/2	3.05

ARTIFICIAL SILK

A more active condition in artificial silk is reported by the manufacturers, and it is hoped that a still further demand will manifest itself. Braid manufacturers are still using much of this product but in small lots so far.

150 Deniers English A.,—Bleached	3.00
150 Deniers English B.,—Bleached	2.75
150 Deniers English C.,—Bleached	2.55

*Pennsylvania, Wilkesbarre. Construction work has been started on the new 4-story addition, 80 by 48 feet, for the Wilkesbarre Silk Company and on the completion of the enlargement machinery will be installed to give employment to about 100 new hands. Particulars of the equipment have not been decided upon. They operate 65,000 spindles on silk throwing. Steam power is used. Joseph Wadsworth is president; George A. Post, treasurer, and George F. Macfarlane, superintendent and buyer.

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Mills: Passaic, N. J.

The Bradford Durfee Textile School

of

Fall River, Mass.

resumes its sessions for day classes on Sept. 20, 1915. Last year its enrollment was 118 in the day classes and 1594 evening students.

In the General Cotton Manufacturing Course, a Diploma Course of Three years, ten graduated and received diplomas May 1915.

In the Designing and Weaving Course of two years, there were two graduates.
In the Chemistry and Dyeing Course of two years, nine graduated.
In the engineering Course (Steam and Electricity) of two years, five graduated.
There have been classes and special students in Freehand Drawing and Textile Design.

At the close of the term of evening school in March, 419 received certificates for work performed in the twenty-five evening courses.

Day Classes, September to May.
Evening Classes, October to March.
Tuition free to all residents of Massachusetts.
Free catalog upon application.
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SILK MILL NEWS

New Jersey, Paterson. One floor of the Lynch Mill on George St. has been leased by J. H. & C. K. Eagle, Inc., of Shamokin. Fancy looms will be installed and the plant will be managed by John Bentley of Bentley Bros. Just how many looms will be installed is not known at this date. A new mill is to be built at Kulpmont, Pa., as reported below.

Pennsylvania, Kulpmont. J. H. & C. K. Eagle, Inc., will build a new broad silk plant at Kulpmont, which will give employment to about 250 hands. Plans are not fully completed, but the mill will have 250 looms. J. H. & C. K. Eagle, Inc., operate a main plant at Shamokin with 50,000 spindles and 1,000 looms and a branch mill at Treverton. Another branch is being established at Paterson as noted above.

*Pennsylvania, Shamokin. A silk mill is being erected for the Star Silk Throwing Company, recently incorporated with capital stock of $40,000. In the previous report the name of this concern was given as the Silk Throwing Company. The mill will be 200 feet long and is being constructed of cement blocks. Orders have been placed for some of the machinery and equipment will be installed just as soon as the building is finished. At a recent meeting the following officers were elected: P. Frank Barr, president; John Tinley, vice-president; W. K. Heffelfinger, secretary; William Wayne Wirgman, treasurer

New Jersey, Paterson. The reported increase of machinery in the Jansen & Pretzfeld plant consists of replacing narrow looms with wider ones.

New Jersey, Paterson. The Lawrence Silk Mills have been moved from Lyons St. to the Levy Mill, corner River and Bridge Sts., and some machinery added.

Pennsylvania, Chambersburg. Part of the looms moved to the plant of the Piedmont Silk Company from the Janes Silk Mills, at Lackawanna, N. Y., will be started up next week, and the balance of this equipment will be moved here, set up and put in operation as soon as possible. A finer grade of goods is to be produced.

Pennsylvania, Coatesville. S. J. Aronsohn, Inc., are placing 60 new looms and other machinery on their floor here.

Pennsylvania, Erie. H. R. Mallinson & Company, proprietors of the Erie Silk Mills, have awarded the contract to the Henry Shank Company for building an adition to the plant at 26th and Cascade Sts., which will cost about $20,000. The new building will be of saw tooth roof construction, 142 x 101 feet. About 150 additional hands will be employed when the new space is equipped.

*Pennsylvania, Reading. The additional looms being installed in the Lion Silk Mills, 11th and Marion Sts., are not being brought from the Allentown plant of the concern but are additional equipment for this company. As noted in a previous report it is expected that 60 more looms will be added later on.

*Pennsylvania, South Bethlehem. Two thousand spindles comprise the new equipment of the Galla Silk Mills. It was not necessary to build an enlargement for this increase as the present space was not fully occupied.

*Pennsylvania, Stroudsburg. The addition being built to the plant of the Monroe Silk Mills on Main St. will be 15 by 40 feet and will be used for storage purposes. The space now used for storage will be used to increase the manufacturing facilities.

Connecticut, Putnam. The Eureka Silk Mfg. Company has resumed manufacturing, after a long shut down. All of the mills in the city are now running full time and the Manhasset Mfg. Company and the Waterman Worsted Company are running nights.

*New Jersey, Sterling. For the first time since the closing of the mills eight months ago on account of a strike among the weavers, the Stirling plant of Schwarzenbach-Huber Company is running with a full force.

Pennsylvania, Dunmore. O. F. Kerstetter, of Nanticoke, and Nathan Everett, of Lehighton, have purchased the Corona Silk Throwing Mill here which has been idle for some time and will start up the plant at once. Mr. Everett operates a silk plant at Weissport, Pa.

Pennsylvania, Weatherly. The local silk weaving mill, which has been idle for several months, will be started up in a few days under the name of the Weatherly Broad Silk Company. Charles McGowan, of Scranton, and J. A. Malone of Philipsburg, N. J., are interested.

*Massachusetts, Adams. In connection with the report of improvements at the Renfrew Mfg. Company they state that they contemplate the revamping of their spinning mills and the addition of a total of about 30,000 spindles during the next year or two. New machinery will replace old equipment and some additions will be made.

Massachusetts, Clinton. Changes and improvements are being made in the finishing department of the Lancaster Mills. Dividing partitions are to be torn down and some alterations made and new dryers will be installed.

*Massachusetts, Fall River. The building to be erected by the Davis Mills on Warren St. will be completed in about six weeks. It will measure 50 by 110 feet, and will be used for storage purposes. Automatic sprinklers will be installed.

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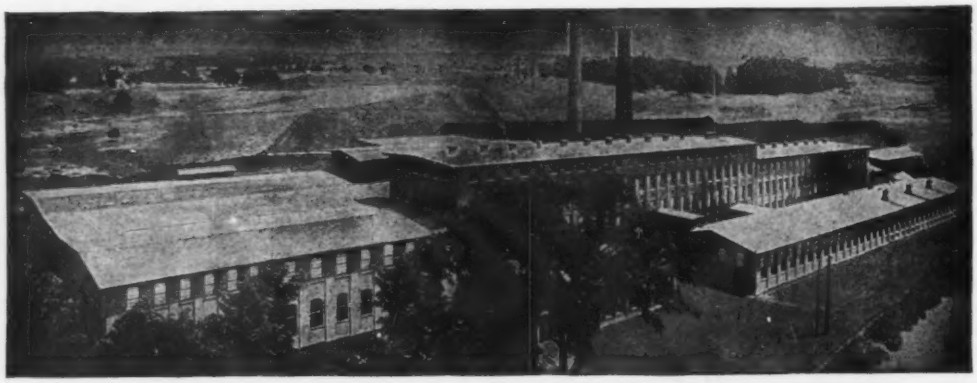

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ASSETS, January 1, 1915 ..... $35,313,539.27
LIABILITIES (Except Capital) 16,610,065.11
SURPLUS AS REGARDS POLICY HOLDERS ... 18,703,474 16

Losses Paid Since Organization over 156,000,000.00

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DYESTUFFS AND CHEMICALS

The unsettled conditions in the dyestuff and chemical trades caused by the European situation make it impossible to get quotations which would be of any value to our readers. The dyestuff and chemical list of quotations will therefore be omitted until this trade is again on a normal basis.

FIRES.

Georgia, Columbus. A fire which originated in the dust room and napping room of the Eagle and Phoenix Mills caused some loss and necessitated a partial shut down. The exact amount of loss has not been estimated.

New York, Brooklyn. The plant of the Berlin Knitting Mills, F. Wohl, proprietor, 187 Broadway, has been damaged by fire. The loss is covered by insurance.

New Jersey, Mount Holly. The greater part of the plant of Royle & Pilkington Company, manufacturers of upholstery goods, tapestries, etc., has been destroyed by fire with loss estimated at $100,000. It is said the company has received $82,000 insurance. Reports state that manufacturing will be resumed at once in a building that was not destroyed, arrangements being completed immediately for power and necessary equipment. It is probable that new buildings will be erected on the site.

Pennsylvania, Philadelphia. A fire of undetermined origin destroyed the plant of the Park Sweater Mills, operated by H. Halterman and A. Kunin, located at 2223 South 7th St., where they manufactured a line of sweater coats on 9 knitters. The loss is estimated at $7,000.

MILL NEWS.

South Carolina, Yorkville. Extensive changes and improvements are being made at the Yorkville Mills of Cannon & Company and a considerable amount of new machinery is being added. This is one of the plants of J. W. and J. F. Cannon, of Concord, N. C., and was formerly known as the York Cotton Mills.

Tennessee, Fayetteville. It is reported that the Elk Cotton Mills have decided to go ahead on the construction of a new number 2 mill planned several months ago. The building will be 150 by 125 feet and will be equipped with 5,000 spindles. J. E. Sirrine of Greenville, S. C., has been engaged as architect and engineer.

Texas, Cuero. The Guadalupe Valley Cotton Mills will build an addition of brick and frame construction and will add to the equipment on the completion of this extra space five cards, 4 spinning frames, and 32 looms. Cotton ducks are manufactured.

*Vermont, Burlington. Machinery is being installed in the new adition to the weaving department of the Queen City Cotton Company. The addition is 325 by 50 feet, 1-story high, of brick with saw tooth roof. As noted previously, 125 new automatic looms will comprise the equipment.

Champion Coated Paper Co. Hamilton, Ohio. 180,000 sq. ft. Barrett Specification Roofs over board.

Use the Barrett Specification straight!

There are architects, engineers and owners who still allow their contractors to lay slag or gravel roofs their own way, subject only to general description. Such easy-going specifications are not fair to honest bidders. They invite the use of poor materials and workmanship.

Even if the use of labelled and reputable materials is required and a five-ply roof is specified, a mere difference in the procedure of application may lead to unsatisfactory results.

The Barrett Specification provides the easiest way to insure satisfaction.

In the words of the Underwriters' Laboratories, which recently completed an exhaustive and most gratifying investigation of Barrett Specification Roofs:

> *"These roof coverings are less likely to be defective as a result of improper workmanship than other roofings of the type."*

The Barrett Specification provides, in addition, a method of inspection after the roof is laid by exposing a sample cross-section so that the completeness of the work is easily ascertained.

Insist that The Barrett Specification be included *in full* in the roofing specifications and you'll be ordering a roof that will cost less than any other kind because it will give protection and satisfactory service for twenty years or more.

Special Note We advise incorporating in plans the full wording of The Barrett Specification, in order to avoid any misunderstanding. If any abbreviated form is desired, however, the following is suggested:

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A copy of The Barrett Specification, with roofing diagrams, free on request.

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St. John, N. B. Halifax, N. S. Sydney, N. S.

TRADE B MARK

MILL STOCKS

	Par Value.	Bid.	Asked.
American Linen	100	...	...
Arkwright Mfg. Co.	100	56	65
Barnaby	100	...	40
Barnard Mfg. Co.	100	35	...
Border City Mfg. Co.	100	105	...
Bourne Mills	100	100	...
Chace Mills	100	100	102½
Charlton Mills	100	92	...
Conanicut Mills	100	...	95
Cornell Mills	100	150	...
Davis Mills	100	107½	111
Davol Mills	100	90	...
Flint Mills	100	97	...
Granite Mills	100	75	...
Hargraves Mills	100	...	43
King Philip Mills	100	107	...
Laurel Lake Mfg. Co.	100	...	100
Lincoln Mfg. Co.	100	75	...
Luther Mfg. Co.	100	118	...
Merchants' Mfg. Co.	100	77½	82½
Mechanics' Mills	100	77	80
Narragansett Mills	100	...	92½
Osborn Mills	100	...	97
Parker Mills	100	40	...
Pilgrim Mill, pfd.	100	...	95
Pocasset Mfg. Co.	100	...	95
R. Borden Mfg. Co.	100	...	140
Sagamore Mfg. Co.	100	175	190
Seaconnet Mills	100	...	55
Shove Mills	100	70	75
Stafford Mills	100	67	72½
Stevens Mfg. Co.	100	123	...
Tecumseh Mills	100	105	...
Troy C. & W. Mfg. Co.	500	...	...
Union Cotton Mills	100	170	...
Wampanoag Mills	100	...	70
Weetamoe Mills	100	...	80

NEW BEDFORD MILLS

	Bid.	Asked.
Acushnet Mill	157½	...
Beacon Mfg. Co., com.	102	...
Beacon Mfg. Co., pfd.	112½	...
Booth Mfg. Co., com.	30	...
Booth Mfg. Co., pfd.	75	...
Bristol Mfg. Co.	75	80
Butler Mill, com.	...	75
Butler Mill, pfd.	...	100
City Mfg. Co.	82	...
Dartmouth Mfg. Co., com.	...	*165
Dartmouth Mfg. Co., pfd.	100	...
Gosnold Mills, pfd.	86	...
Grinnell Mfg. Co.	125	...
Holmes Mfg. Co., com.	130	...
Holmes Mfg. Co., pfd.	...	115
Hathaway Mfg. Co.	200	...
Kilburn Mills	125	...
Manomet Mills	120	...
Nashawena Mills	...	80
Neild Mfg. Co.	...	115
N. B. Cotton Mills Corp., com.	100	...
N. B. Cotton Mills Corp., pfd.	...	100
Nonquitt Spinning Co.	...	90
Page Mfg. Co.	...	76
Pierce Mfg. Co.	305	...
Pierce Bros.	100	...
Potomska Mills	125	...
Quisset Mills, com.	122	*123
Quisset Mills, pfd.	111	113
Sharp Mills, com.	86	...
Sharp Mills, pfd.	...	105
Soule Mills	...	82½
Taber Mills	*100	...
Wamsutta Mills	120	122
Whitman Mills	*128	*130

SOUTHERN MILLS

	Bid.	Asked.
American Spinning Co.	155	...
American Spinning Co., pfd.	100	...
Arkwright Mills	...	100
Avondale	120	126
Arlington	130	140
Brookside	...	...
Cannon	150	...
Carbarrus	115	...
Chadwick-Hoskins	...	...
Chadwick-Hoskins, pfd.	...	100
Clara	100	...
Cliffside	175	...
Columbus Manufacturing Co.	94	100
Darlington	...	83½
Erwin, pfd.	...	101
Easley	...	175
Florence	125	130
Gibson, com.	...	105
Grendle	...	96
Glenwood	...	150
Glen Lowry, pfd.	...	76
Highland Park	151	200
Highland Park, pfd.	...	100
Hartsville	175	195
Hartsville, pfd.	...	100
Henrietta Mills	...	125
Kesler	150	160
Loray Mills, pfd.	...	85
Modena	...	96
Monarch, S. C.	115	...
Newberry	125	...
Norris Mills	...	121
Ninety-Six	130	140
Orr	...	36
Ozark	100	110
Pacolet Mfg. Co., pfd.	100	...

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Patterson	140	...
Piedmont Manufacturing Co.	150	167
Pell City, Ala.	...	80
Poe, W. F., Manufacturing Co.	100	103
Salisbury	150	...
Roanoke Mills	...	155
Saxon	...	...
Spartan	100	110
Toxaway	...	131
Warren Mfg. Co., com.	78	...
Warren Mfg. Co., pfd.	...	107
Washington Mills	...	...
Washington Mills, pfd.	...	100
Woodside Mills Co., com.	...	88½
Woodside Mills Co., pfd.	...	80
Woodside Mills Co., guar.	...	101
Watts	...	35
Williamson	...	125
Ware Shoals	70	...
Whitney	110	120
Woodruff	...	107
Young Hartsell	90	...

OTHER NEW ENGLAND MILLS

	Par Value.	Last Sale.
Amoskeag Mfg. Co., com., N. H.	100	64¼
Amoskeag Mfg. Co., pfd., N. H.	100	99
American Mfg. Co.	100	117½
Androscoggin Mills, Me.	100	155
Arlington Mills, Mass.	100	80½
Appleton Co., Mass.	100	172
Bates Carpet Co., Me.	100	236½
Berkshire Mfg. Co.	100	190
Boston Belting Co.	100	*113
Bigelow-Hartford, pfd.	100	103⅓
Boston Duck Co., Mass.	100	1280
Boston Mfg. Co., Mass.	100	105¼
Cabot Mfg. Co., Me.	100	100
Chicopee Mfg. Co., Mass.	100	90
Columbia Mfg. Co.	1000	1365
Continental Mills, Me.	100	75¼
Cordis Mills	100	140
Draper	100	227¼
Dwight Mills, Me.	100	1000

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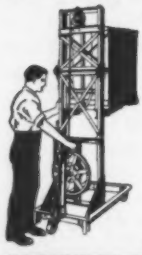

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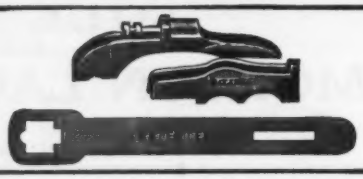

Edwards Mfg. Co.	100	99
Essex Co., Mass.	100	195
Everett Mills, Mass.	100	115
Fisher Mfg. Co., Mass.	100	125½
Franklin Co., Maine	100	201½
Great Falls Mfg. Co., N. H.	100	187¾
Hamilton Woolen Co., Mass.	100	80
Hamilton Mfg. Co., Mass.	100	77½
Harmony Mills	100	90
Hill Mfg. Co., Me.	100	85
Lancaster Mills, Mass.	100	76
Lawrence Mfg. Co., Mass.	100	*150
Lockwood Co., Me.	100	100
Lowell Bleachery, Mass.	100	126½
Lowell Hosiery, Mass.	100	40
Lyman Mills, Mass.	100	118¼
Massachusetts Cotton Mills, Ga.	100	99
Massachusetts Cotton Mills, Mass.	100	118¼
Merrimack Mfg. Co., Mass.	100	27
Merrimack Mfg. Co., pfd.	100	83
Middlesex Co., Mass.	100	55
Middlesex Co., pfd., Mass.	100	75
Monadnock Mills, N. H.	100	1000
Nashua Mfg. Co., N. H.	500	711¼
Naumkeag Steam Cot. Co., Mass.	100	202
Newmarket Mfg. Co., N. H.	100	95¼
Otis Mfg. Co., Mass.	1000	2805
Pacific Mills, Mass.	100	*118
Pepperell Mfg. Co., N. H.	100	345
Pepperell Mfg. Co. (new)	100	120¼
Plymouth Cordage Co., Mass.	100	189¼
Salmon Falls Mfg. Co., N. H.	300	23½
Shaw Stocking Co., Mass.	100	75
Suncook Mills, N. H.	100	20
Thorndyke Mfg. Co., Mass.	1000	1305
Tremont & Suffolk Mills, Mass.	100	100¼
Waltham Bleachery & Dye Works, Mass.	100	*100¼
York Mfg. Co., Me.	100	85
York Mfg. Co., Me.	100	90

CANADIAN MILLS

	Bid.	Asked.
Can. Cottons	90	...
Can. Cottons pfd.	73½	...
Dom. Textile	73	73½
Dom. Textile, pfd.	...	102
Mont. Cotton, com.	...	51
Mont. Cotton, pfd.	...	100

*Ex dividend.

*South Carolina, Enoree. A new company has been organized under the name of the Melville Mfg. Company, by the interests which recently purchased the mill of the Enoree Mfg. Company. J. I. Westervelt, formerly an officer in Greenville mills, is president. Other officers have not been elected. The capital stock of the company is $500,000. The mill will be started up about September or October.

Massachusetts, Great Barrington. Material is being run out of machinery in the Barrington Mills preparatory to closing. It is reported the management hopes to start up the plant again within a short time.

Interruption of Production

is recognized by textile mill operators as the most costly element of repairs.

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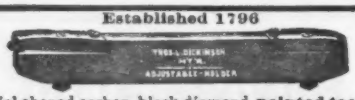

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MILL NEWS

Connecticut, Thompsonville. During the last few weeks a considerable amount of new machinery has been moved here to the local plant of the Bigelow-Hartford Carpet Company from the plant at Lowell. Preparations are being made to increase the power equipment, which may indicate a further expansion in the equipment in the mills. Manufacturing has been resumed following a vacation period of two weeks, and from now on it is expected that they will run steadily, as the business outlook in this line is considered better than for some time past.

*Indiana, Mexico. No definite plans have been made as yet for the proposed enlargement of the Mexico Woolen Mills, recently outlined. A new company may be formed later on to undertake this development. The concern started a year or two ago and has made practically continuous increases in the equipment and output and is planning to build a new building at a cost of from $50,000 to $75,000.

Kentucky, Louisville. There will be an increase in the amount of the equipment of the Sterling Spinning Company, Inc., but arrangements are not completed. Plans are being considered for removing the plant to some other place and inducements have been made by Indiana cities. This is a comparatively new woolen and merino knitting yarn manufacturing business organized and headed by George Dunham, formerly superintendent of the Falls City Woolen Mills. The present equipment consists of 2 sets of cards and 1,224 spindles, with dyeing equipment. A decision will be reached within a few weeks as to the amount of new machinery to be added and as to the new location if it is decided to leave Louisville.

Maine, Winslow. The Winslow Mfg. Company, which conducts a shoddy plant here, is branching out into the manufacture of broacloths and shirtings with 2 sets of cards, 10 broad looms, dyeing and finishing equipment on the new lines. Water power is used. A selling house has not been selected as yet. Edw. Chase is president, treasurer and buyer. The post office address is R. F. D. No. 39, Waterville.

*Massachusetts, Clinton. Contract for building the new mill at the Clinton plant of the Bigelow-Hartford Carpet Company has been awarded to the Flynt Construction Company, of Palmer. The new mill will be erected between the two mills on Main St. on the site of the old office building which has been moved across the road and will be fitted up as a club house.

*West Virginia, Philippi. Construction work is to be started at once on a mill for the new Philippi Woolen Mill Company and it is expected that manufacturing will be started about November 15. As noted in previous reports this company has been organized with capital stock of $25,000 and will manufacture woolen blankets, beginning operations with 2 sets of cards, 10 looms, dyeing, finishing and steam power equipment. John A. White has been elected president and Waitman D. Corder, secretary and treasurer.

FACTS AND GOSSIP.

*Georgia, Columbus. The recent fire in the napper room of the Eagle & Phoenix Mills was a very small matter and no interruption whatever was caused to the mill operations. Practically the only damage was in the small amount of goods in process.

Indiana, South Bend. It is reported that a new organization, capitalized for $400,000, is being organized in South Bend and Chicago to succeed the South Bend Woolen Mfg. Company.

Kentucky, Danville. Nelson D. Rodes, C. C. Bagby and others, are investigating conditions in the knitting industry, preparatory to making plans for establishing a knitting mill in Danville.

Kentucky, Louisville. Neville S. Bullitt, Keller Bldg., Louisville, has been making investigations with a view to the organization of a hosiery mill at Louisville, but has decided to take no action on the project for the present. Mr. Bullitt is secretary and treasurer of the Paper Makers' Company, First National Bank Bldg., Cincinnati.

*Maine, Sangerville. It is understood that arrangements are being made for the new Glencoe Woolen Company to start up the Sangerville Woolen Mills, but arrangements have not been completed. L. J. Coburn, treasurer of the new company, states that no information can be given out at this time.

Maryland, Baltimore. A concern known as the Spanish-American Syndicate is said to contemplate establishing a plant for manufacturing guncotton. Some of the men reported to be interested are Joseph C. Reed, Care Norvel-Shapleigh Hardware Company, St. Louis, Mo.; Leon Rasst, 1,902 Eutaw Place, Baltimore, and F. D. Richardson, Care Texas & Pacific R. R., New Orleans, La. An expenditure of $50,000 is said to be contemplated.

Massachusetts, Boston. The Commonwealth Thread Company, Inc., has been organized with capital stock of $4,000 to manufacture and deal in thread and twine. The concern does winding and some twisting and has a place of business at 62 Washington St., N.

Massachusetts, Clinton. It is reported that the Sterling Mills of Philadelphia, manufacturers of Turkish towels and terry cloths on 12 looms, will move to Clinton, and occupy a part of the space in the Brodfelt Mills. A new concern, known as the Clinton Textile Company, is now operating 10 looms in the Brodfelt Mills on worsted dress goods.

Massachusetts, East Douglas. The Tally-Ho Knitting Company, manufacturers of athletic knit goods, expect shortly to add the manufacture of a line of silk sweaters.

Massachusetts, Franklin. It is reported that C. H. Harper, formerly with the Franklin Towel Company, is looking for a location in the East for an equipment for the manufacture of Turkish towels, etc.

Massachusetts, Millbury. A night and day schedule is in force at the Millbury Mills which are running on automobile cloth.

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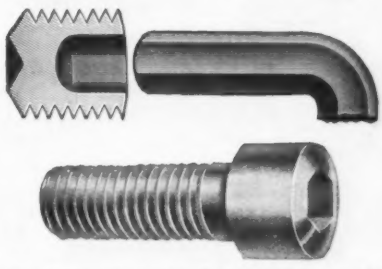

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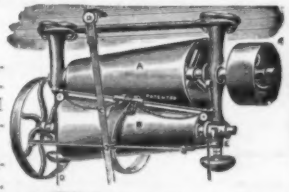

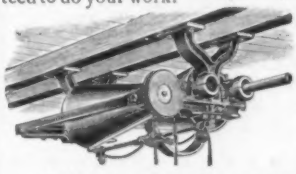

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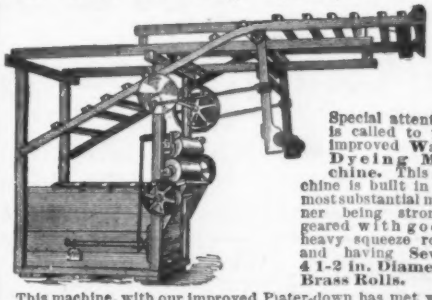

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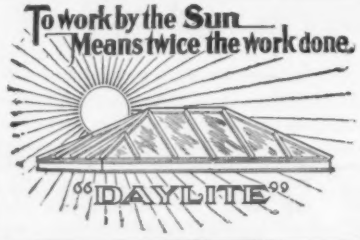

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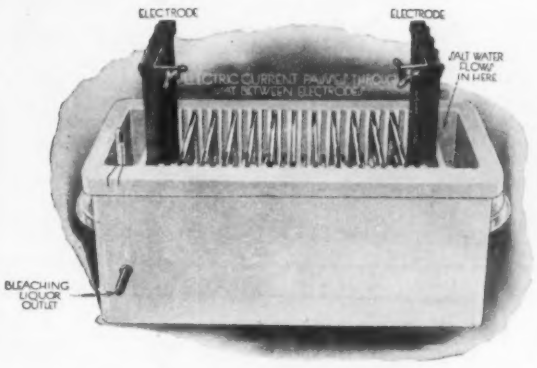

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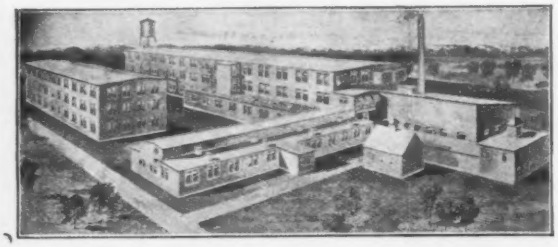

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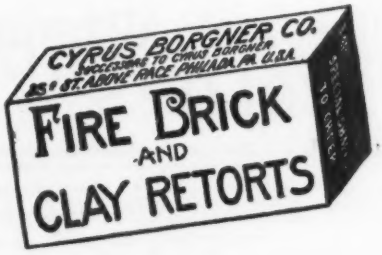

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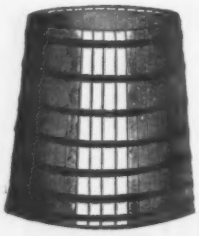

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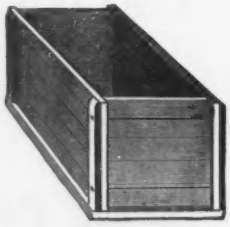

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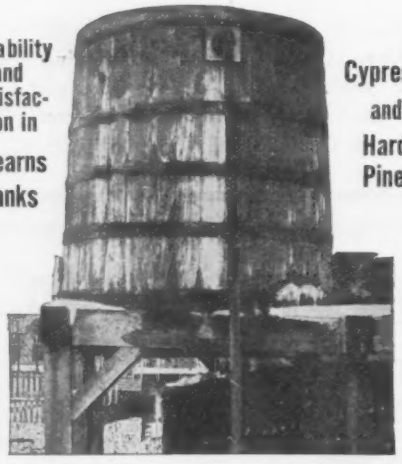

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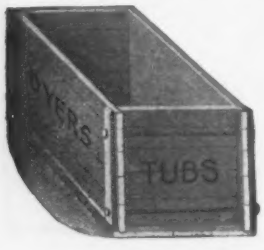

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We can give you Direct, Acid, Sulphur, Chromate and Vat Dyes

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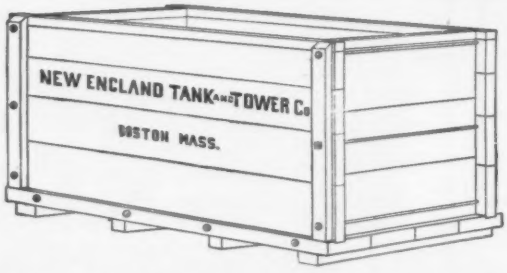

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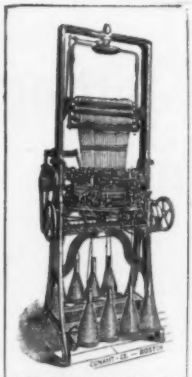

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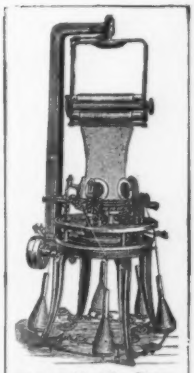
Knitting Machinery

Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder.



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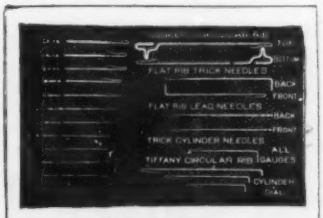
Spring Needle Cylinder Rib-Top Machines

For making Cuffs, Drawer Bottoms and Shirt Borders.



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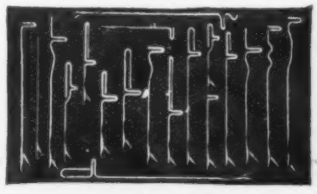

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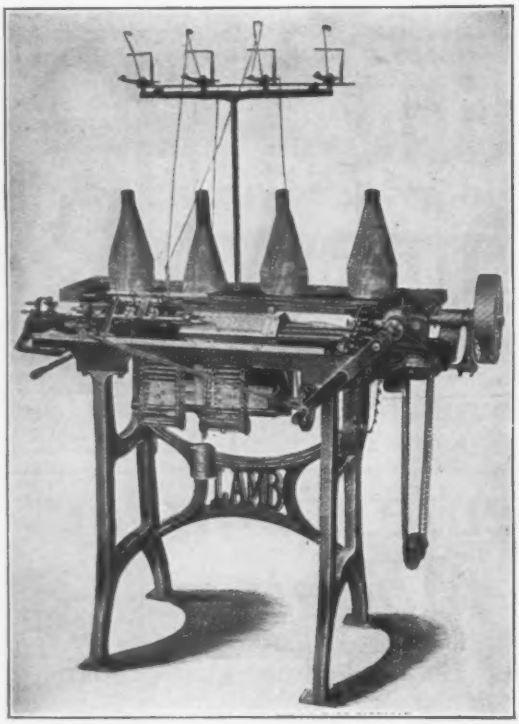

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Lamb Knitting Machines

The American Machine
Originated in America in 1856

For the last sixty years the

Lamb Knitting Machines Have Had the Habit of Making Good

No matter where they are used or under what conditions. The fact is due to

their Productive Capacity,
their Simplicity,
their Accessibility

We are prepared to furnish the Knitting Mills of this continent with a superior product and at short notice.

We call your attention to a few of our new improved machines:

Automatic Widener for Sleeves and Collars
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Four colors—Automatic 3 needle rack
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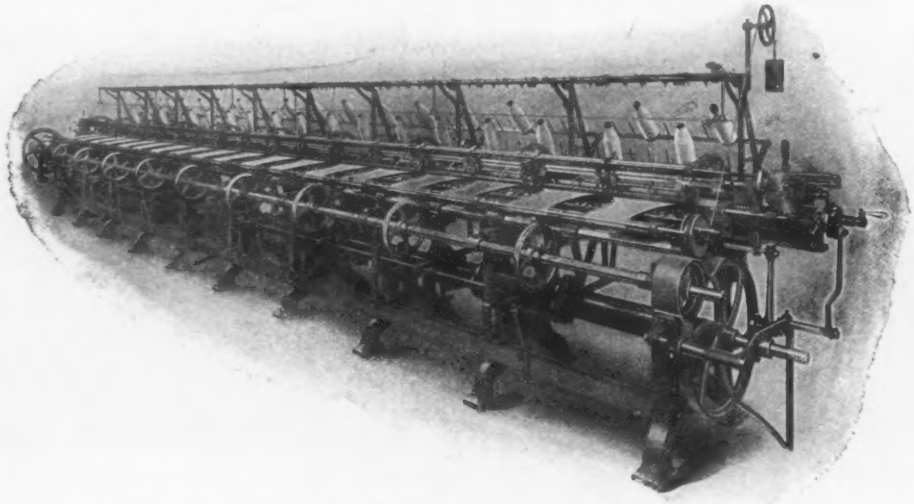
Largest Manufacturers of all Classes of Hosiery Machines



Schubert & Salzer, in addition to the plant of H. Alban Ludwig, have recently acquired the plant of Theodor Lieberknecht and continue to build Full Fashioned Hosiery Machines in each of the three plants, retaining the special features of each individual type and at the same time using on all three machines various patented devices and all the practical attachments known to the trade. These machines are built in all gauges from 14 to 34 needles to the inch and from 12 to 24 sections.

Best Constructed, Most Economical and Productive Machines on the Market

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All the leading manufacturers of full-fashioned hosiery in this country.

American Representative:

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Banner Full Automatic Hosiery Machine

A FEW OF THE NEW FEATURES

Over
20,000
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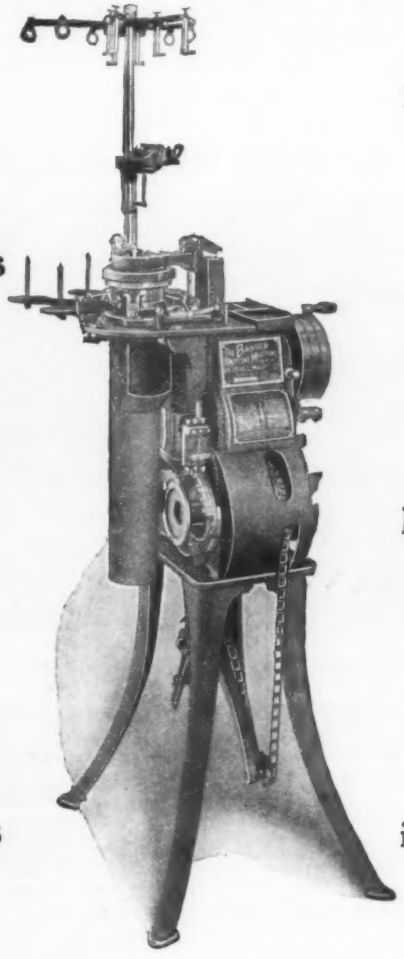
Machines
in
successful
operation



All working parts accessible from *front* of machine

Five Yarn Changing Levers

Automatic Transferring Device

New and *Novel* Device for High Splice and Double Sole Slackening

New Yarn Engaging Device

High Speed in *Heel* and *Toe*

Single Pick

Average
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100 machines
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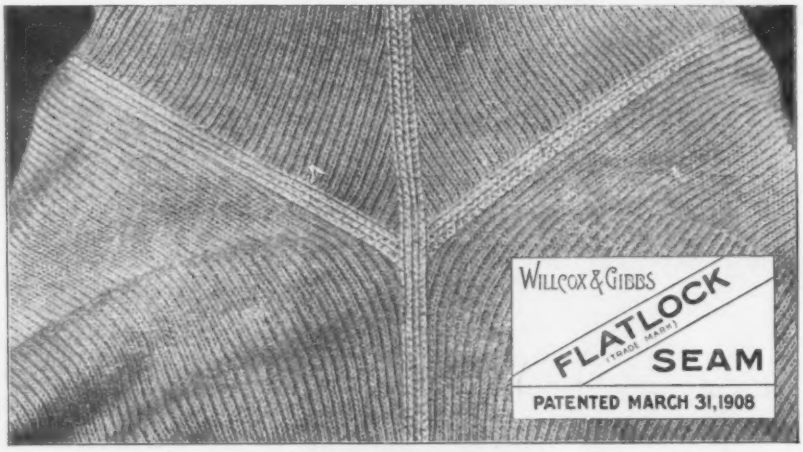
"GIVE US A FLAT SEAM"

The cry of the Knit Goods Trade ***for 25 years*** has been, **"Give us a Flat Seam"** to keep pace with improvements in texture and finish of Cut Knit Underwear.

This urgent cry has remained unanswered until our solution of the mechanical problems involved produced—

A RESULT NEVER BEFORE REACHED



Domestic and Foreign Patents on Both Machine and Product

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A Perfect Union of
ABUTTED CUT EDGES
Forming a very Strong, Soft and Smooth

FLAT SEAM
No Thicker than the Fabric Itself, is Made in One Operation, and at High Speed, on our

"FLATLOCK" MACHINE
Trade Mark Reg. U. S. Pat. Off.

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1915 Achievement
The Tandem Interlock Machine
making a seam *absolutely flat*

by its cost or by the service rendered?

DO YOU JUDGE YOUR AMUSEMENTS BY THE MONEY YOU SPEND—
or by the pleasure you receive?

DO YOU JUDGE A HOTEL BY THE RATE PER DAY—
or by what you get in return?

DOES LOW PRICE ACTUALLY GIVE YOU AS MUCH GENUINE SATISFACTION AS GOOD QUALITY?

THEN WHY JUDGE A "UNION SPECIAL" MACHINE BY ITS FIRST COST?

INSIST ON "UNION SPECIAL" MACHINES AND THE FIRST COST WILL BE LOST SIGHT OF IN YOUR DELIGHT OVER THEIR PERFORMANCE.

Union Special Machines for Every Operation in the Manufacture of Knit Goods

UNION SPECIAL MACHINE COMPANY

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BONE DRY
HOSIERY FINISHING BOARDS

THAT WORK ABSOLUTELY SMOOTH

Prompt Service

Right Prices

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1825 E. Boston Ave.
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FRIEDBERGER-AARON MFG. CO.

LEADING MANUFACTURERS

Braids and Edgings

For Trimming Ladies' Ribbed Underwear

OUR MOTTO:

Correct Goods, Right Prices, Prompt Deliveries

Mills: Wayne Junction, Philadelphia

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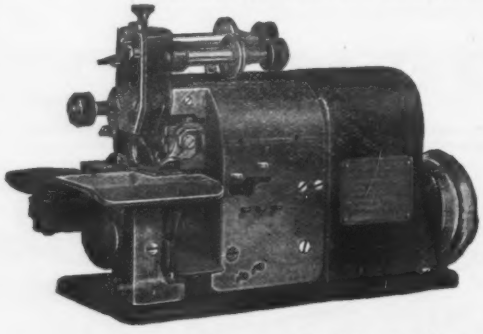
FAST

DURABLE

Light Running

High Speed Overseaming, Overedging and Shell Stitch Machines are



OUR CLASS 60 MACHINES for Trimming and Overseaming in one Operation produce the strongest, best Seams and do it with the greatest economy.

USE STYLE 18 for Horse Blankets.
STYLE 17 B or 22 for Bed Blankets.
STYLE 35 E SHELL, for Necks and Fronts of Rib Goods, produces the most showy, substantial finish.

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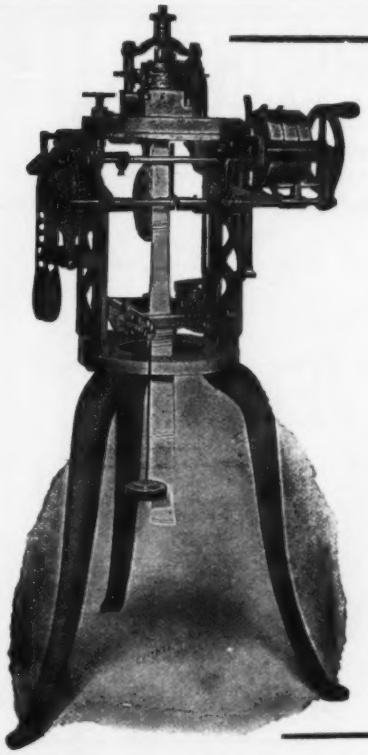

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BUILDERS OF

Circular Knitting Machinery

of every kind for every purpose

HOSIERY RIBBERS

with Splicing, Striping, Two-speed, Selvage Welt and French Welt Attachments.

Full Automatic Hosiery Footers

BODY MACHINES, SLEEVERS, etc.

for Underwear, Sweaters, Toques, etc.

NECKTIE MACHINES

for making all kinds of tubular knitted scarfs.
Write for catalog, prices and samples.

THE MOST COMPLETE LINE OF

Sweater Coat Machines

Automatic Racking Machines with or without striping attachments.
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Manufacturers of

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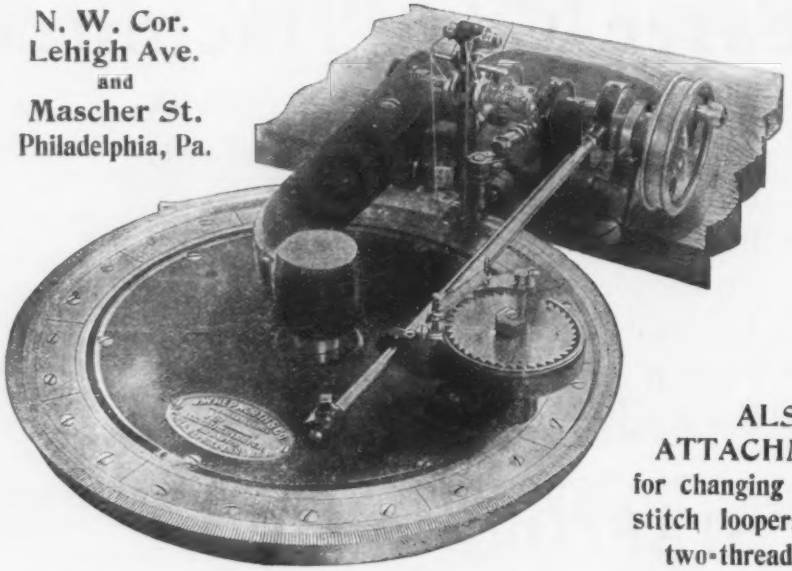

Makers
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Two
Thread
Elastic
Lock
Stitch
Loopers

ALSO
ATTACHMENTS
for changing our single stitch loopers into the two-thread loopers

NYE & TREDICK CO.

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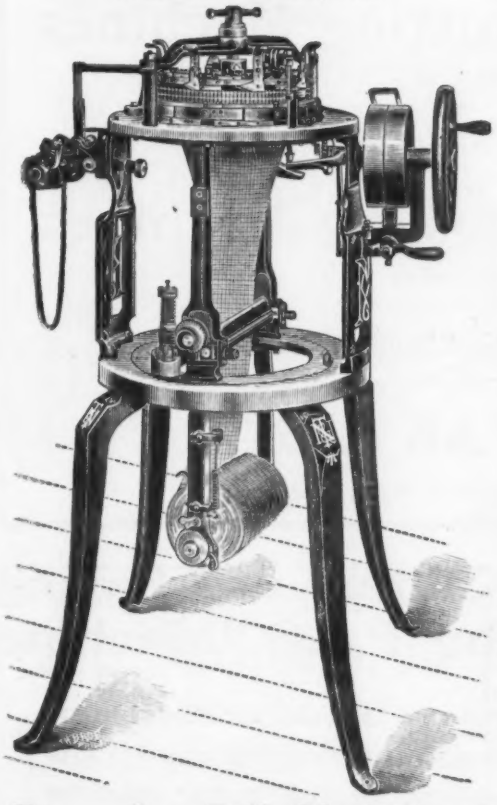

Circular Rib Knitting MACHINERY

For making Ribbed Underwear, Combination Suits, Sweaters, Cuffs, Shirt Borders, Hosiery, etc. Correct Construction, Excellence and Durability.

LATEST IMPROVEMENTS

Quality of Fabrics and Production
UNEXCELLED

NYE & TREDICK CO.

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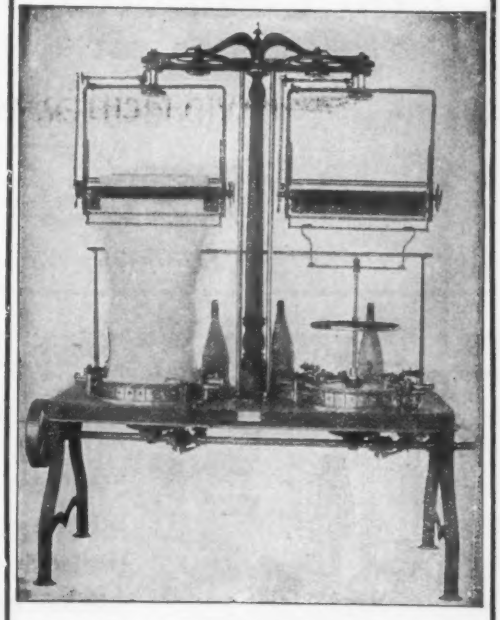
Established 1870 — LAKEPORT, N. H. — Incorporated 1890

Spring and Latch Needle Machines

for both Rib and Plain Work
Economically Producing

A GREAT VARIETY OF FABRICS



Spring Needle Underwear Machine with Automatic Takeup

This machine is made in sizes from 13" to 25" in diameter of any desired gauge, the number of feeds depending on the size of cylinders,

Also built in sizes from 2½" to 32" in diameter for the production of a great variety of fabrics.

Aside from the feeds for plain fabrics the stockinet, eider down and astrachan feeds are superior to any on the market.

Many of these machines are in use in the leading mills.

SOME CRANE FEATURES.

Patent removable hardened Wing Burr Wheels.
Patent Thread Stop Motion can be fitted to 20" and 32" frames and are specially adapted for making fine Jersey Cloth and Stockinet.
Our flat machine is adapted for knitting collarettes.

E. O. SPINDLER

350 Broadway, New York, N. Y.

AGENT FOR

"Dubied" Flat Knitting Machines

For the sweater, etc. trade

BUILT BY

EDWARD DUBIED & COMPANY, Couvet, Switzerland

AND

Full Fashioned Hosiery Machines

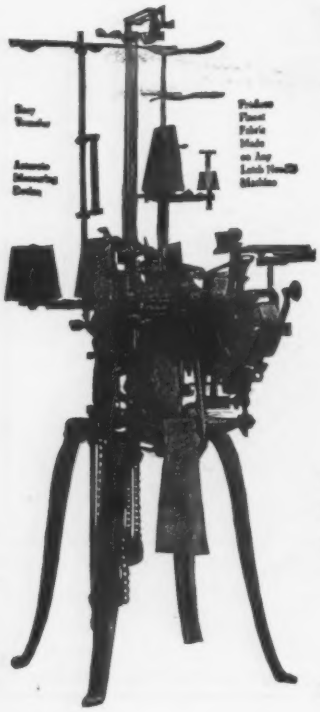
"Cotton System"

BUILT BY

DAVID RICHTER, INC., Chemnitz, Saxony

BUSINESS AS USUAL

Your inquiry will receive prompt attention



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"We are running this machine beside another popular knitter on silk and art silk plaited hosiery. On the 'P.&O.' machine we are making less menders, a more even fabric and bigger production. In fact it is the best machine we have in our mill."

SAVES 10% ON YARN

Makes Ladies' or Half Hose; garter top; no ravel, silk plaited or mercerized leg; high splice, double sole; advanced toe; linen or mercerized heel and toe.

Write for full particulars

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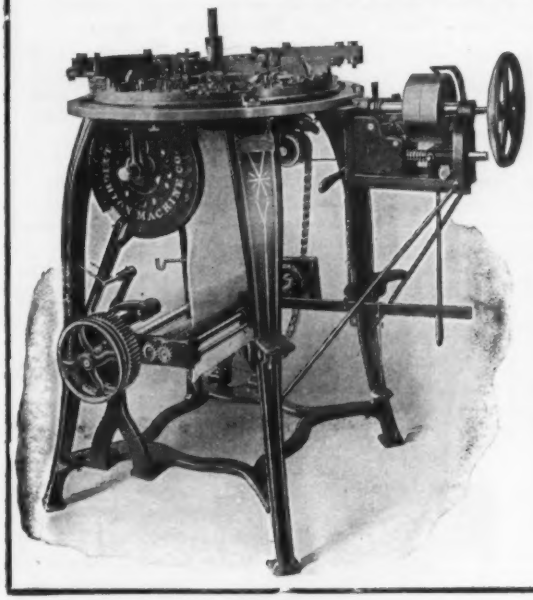
THE LEIGHTON KNITTER

HAS EARNED THE REPUTATION OF PRODUCING



Firm, Elastic Garments

USING LOW GRADE STOCK

THESE MACHINES ARE BEING USED FOR

High Grade Goods

MORE AS COMPETITION INCREASES

Real Efficiency

Means Excellent Stitches with ECONOMICAL OPERATION

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LEIGHTON MACHINE CO.

Manchester, N. H.

HOW MUCH OF THIS

$10,000,000.00

DO YOU WANT?

About $10,000,000.00 worth of full fashioned stockings are made in America each year.

No matter what proportion of these millions you are now getting, you can get more of it if you will make full fashioned hosiery on our machines.

Because, the stockings you make will fit perfectly and bring you repeat orders.

The leading hosiery manufacturers are installing these machines.

If you are thinking of making full fashioned goods take up the question with us—as our success depends upon yours, we will prove to you that we can help you before you spend a cent.

TEXTILE MACHINE WORKS

READING, PA.

THE MAKERS OF AMERICAN FULL FASHIONED HOSIERY MACHINES

"Acme" and "Hemphill"

SEAMLESS HOSIERY

Knitting Machines

built by

Acme Knitting Machine & Needle Company

FRANKLIN, N. H.

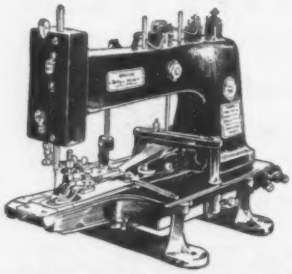
Answer all purposes in the *most reliable*, *up-to-date*, and *economical* manner. Write us for full particulars.

Manufacturers Like our Latch Needles

because we make a superior grade of needles

Philadelphia Office, Bourse Bldg.

Buttons Do Not Come Off If Sewed On By the Elastic Stitch Button Sewing Machine



No Bobbins to Wind. Will Sew All Buttons With Any Thread.
No Threads to Trim. Saves 90% of the Needle Breakage.

This machine is operated with but one thread, which enables it to run at higher speed than a two-thread machine, greatly reducing operation and maintenance expenses. It will sew on any size or style of two or four-hole buttons. Its patent thread-breaking device does away with the use of knives, and leaves the buttons neatly finished—no unsightly loose threads.

Send for "List-of-Users" booklet.

Union Button Sewing Co., Dept., Frederick Osann Co.

394 Atlantic Ave., Boston, Mass. **Agents Everywhere** 245 Seventh Ave., New York

"Maniplex" Sewing Machines

For Multiple Stitching

Built for all purposes where a number of rows of stitching are required. ¶ With either form of stitch, single thread chain, double thread chain, or lock stitch, sewing material from 1-16 inch thick, up to 1 inch thick, and up to 120 inch wide. ¶ Furnished with any desired number of needles, spacing to suit requirements. ¶ We also build **Paper Slitting Machines** and design special machinery.

L. F. FALES

Walpole, Mass., U. S. A.

The New Boss Seamless Knitter

Do you want the biggest production with the least menders, for the least money? If so, write to the Boss Knitting Machine Works for their circular with full directions. There is no cylinder to be handled. We use only one cylinder and transfer device for half hose or ladies' hose. This machine beats them all. Has no equal for simplicity and durability. Makes 300 revolutions per minute. Built in sizes from 2¼ to 5½; from 40 to 224 needles. Automatic in heel and toe. It is the strongest built knitter on earth.

Send for prices and particulars.

THE BOSS KNITTING MACHINE WORKS,

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NEW ENGLAND BUTT COMPANY

304 PEARL STREET, PROVIDENCE, R. I.

BRAIDING MACHINERY

ALL STYLES AND KINDS FOR FLAT AND ROUND BRAIDS

SOLID SASH AND CURTAIN CORDS

SHOE AND CORSET LACES, BANDING

AND ALL BRAIDED FABRICS

The Allen Winders.

Single Side Machines from 6 to 24 Spindles
Double Side Machines from 8 to 18 Spindles to a Side

FOR ART or NATURAL SILK, COTTON and MERCERIZED YARNS.

Small Winders are very useful in Back Winding ends of Cones, or sample skeins, or legs of hosiery that are waste.—The machine illustrated is our No. 1 machine with a perfect fast and slow motion, winding a perfect bobbin that will all knit off.

Built especially for

HOSIERY and UNDERWEAR

All Winders Equipped with Special Swifts for Silk, Art Silk and fine yarns.

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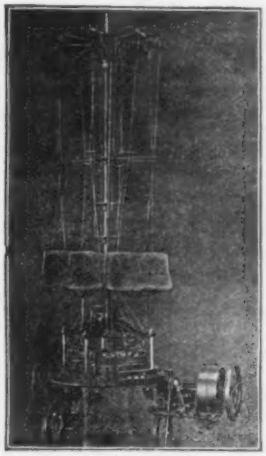

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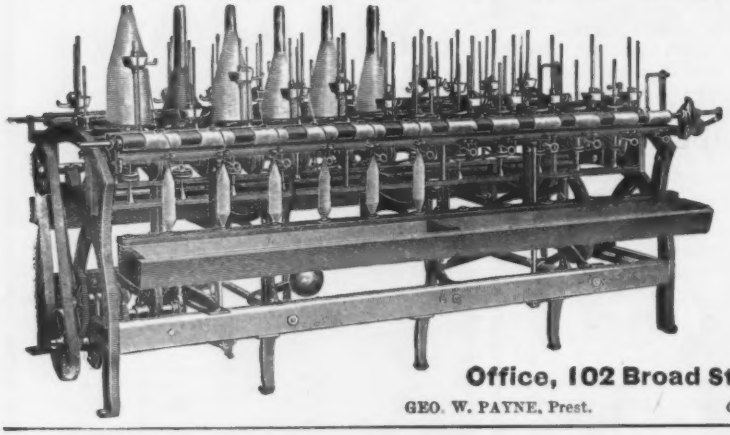

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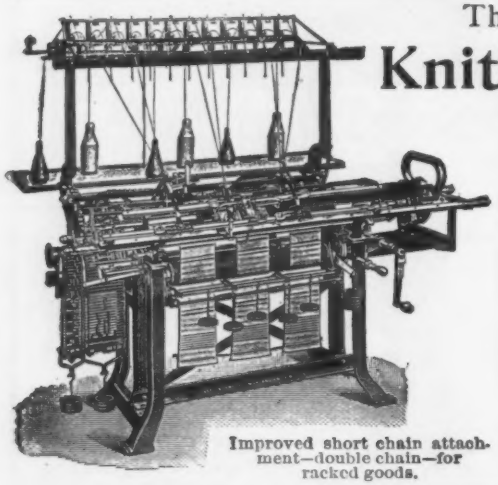

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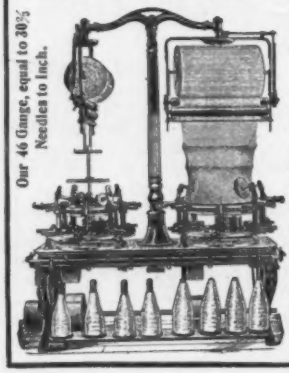

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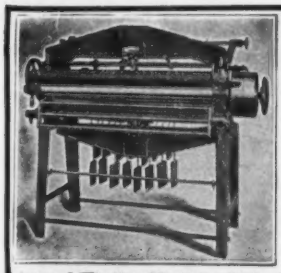

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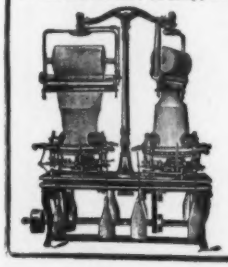

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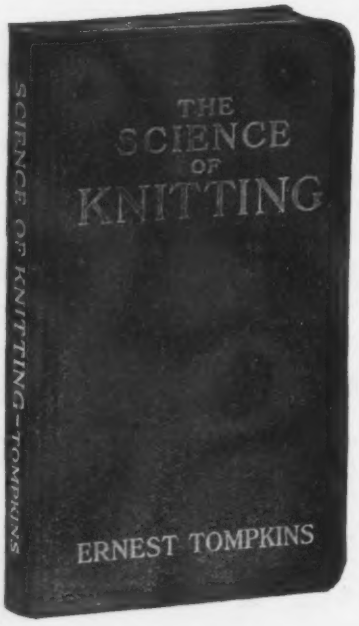

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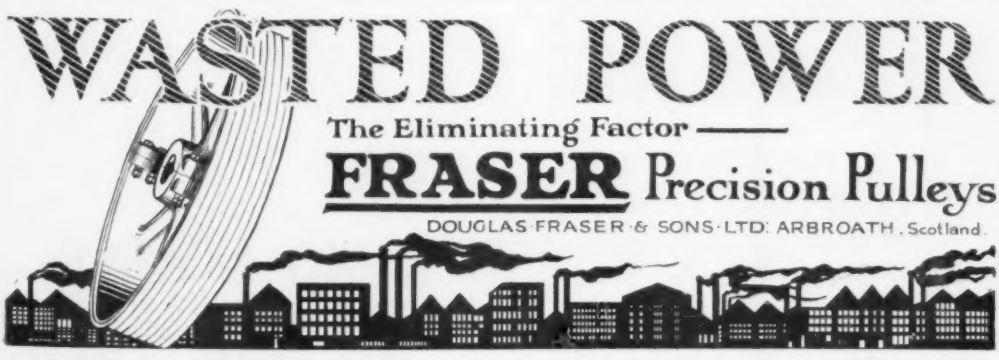

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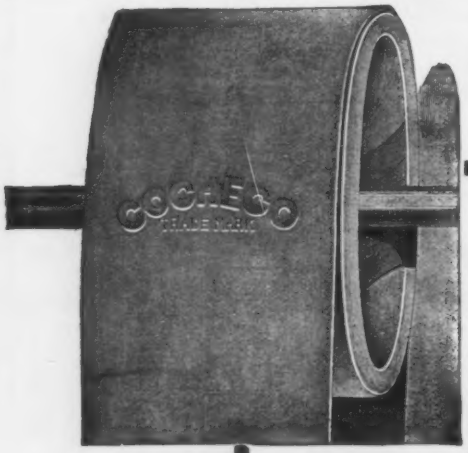

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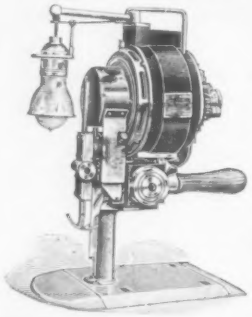

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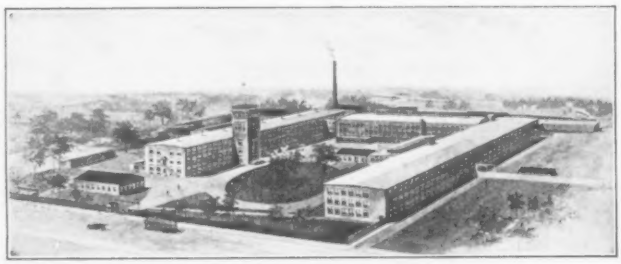

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